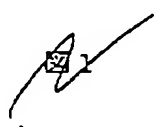


FIG 1

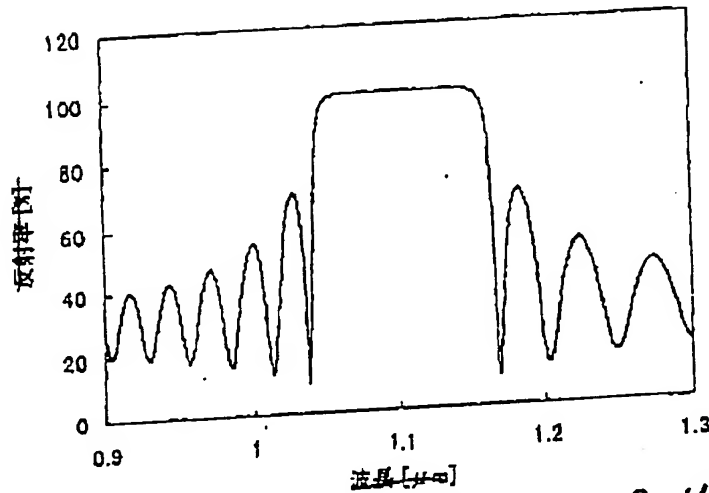


1005204 022607

FIG 2

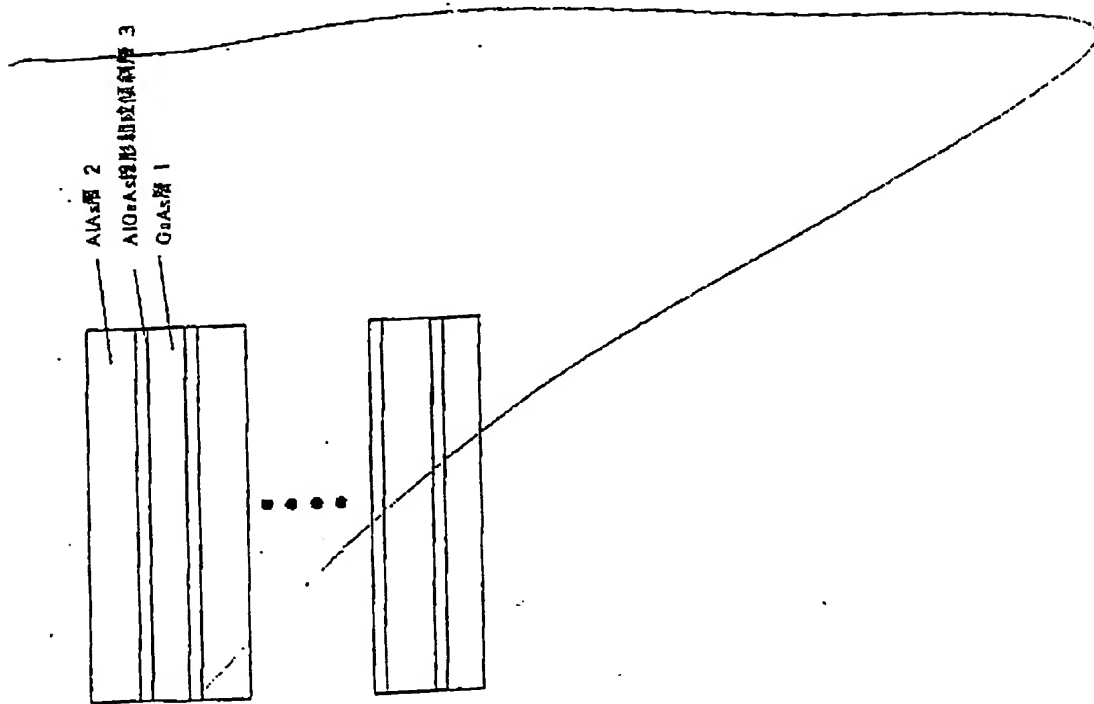
[2]

REFLECTANCE[%]



WAVELENGTH [μm]

[2]



[3]

209220" 4025800T

[WA]
3

FIG 3

18 (12)

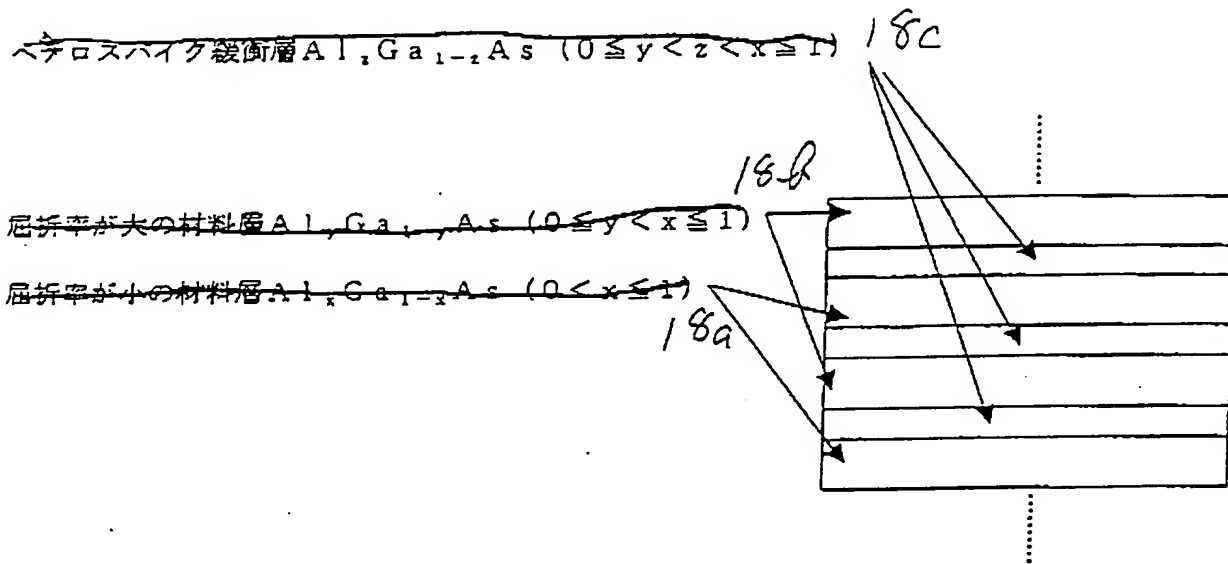
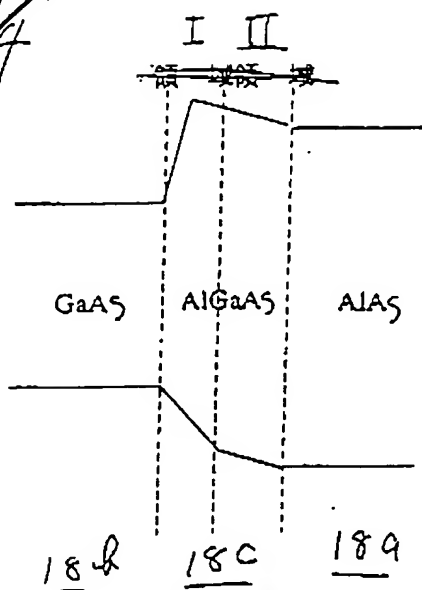


図2

209220"4025800T
10085204.022602

~~[12] 3~~
4

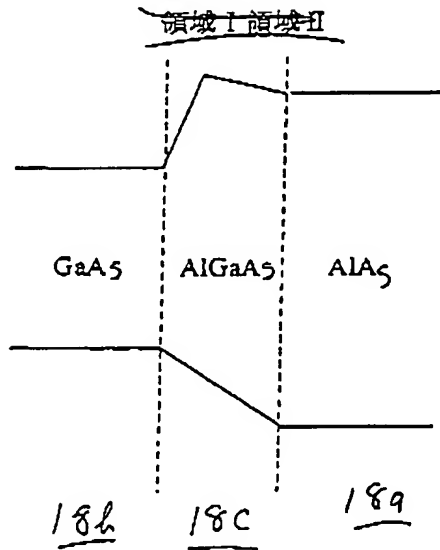
FIG 4



~~[12] 5~~
4

~~图 3~~

FIG 5



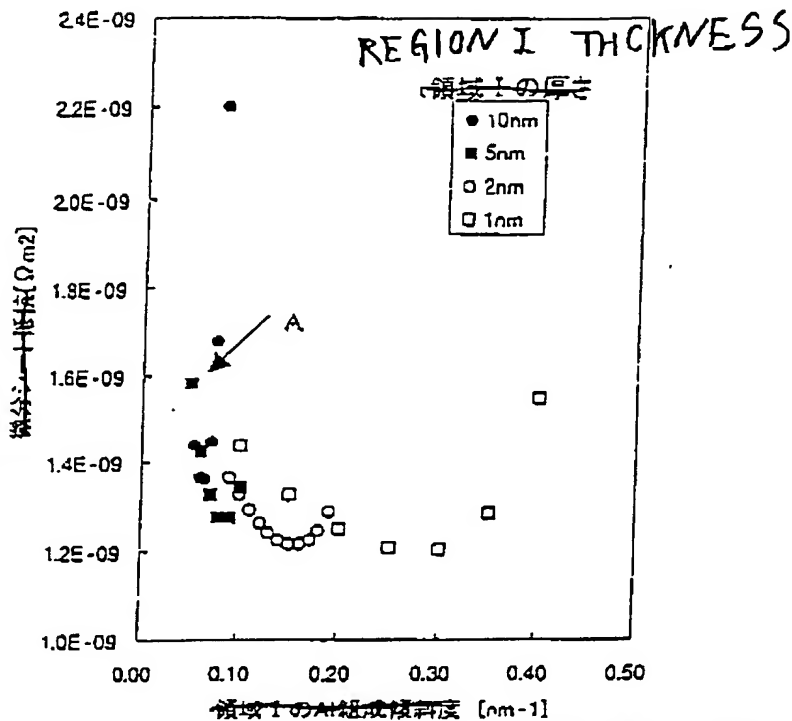
~~图 4~~

209220 10258001
10085204 022602

~~[X] 8~~

FIG 6

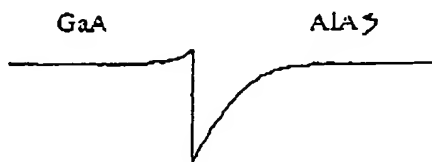
DIFFERENTIAL SHEET RESISTANCE



COMPOSITIONAL GRADIENT IN I

~~[X] 8~~

FIG 7



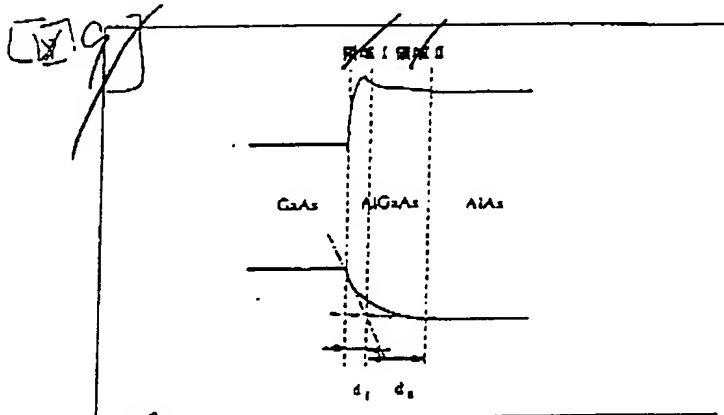
~~[X] 6~~

~~[X] 8~~

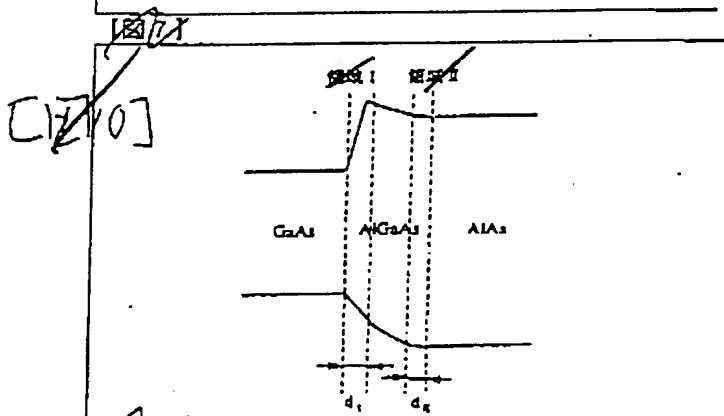
FIG 8



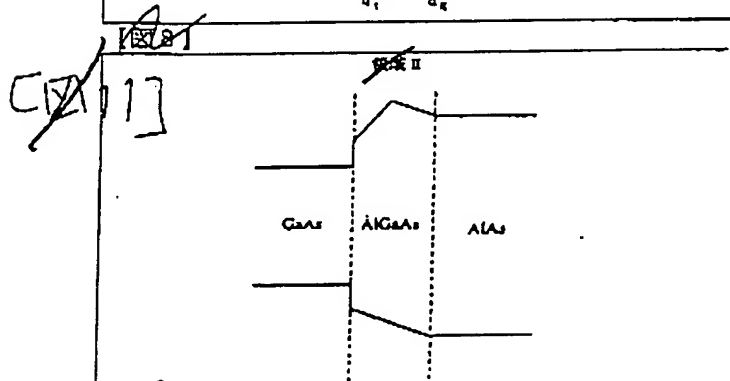
~~[X] 7~~



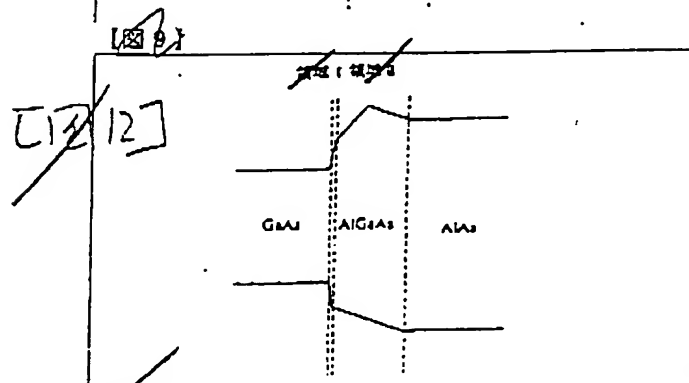
F1G9



F1G10



F1G11

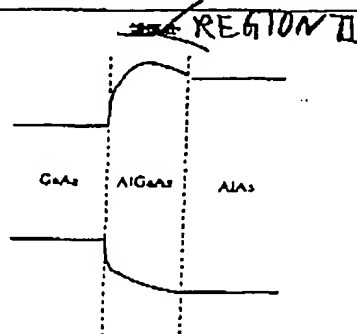
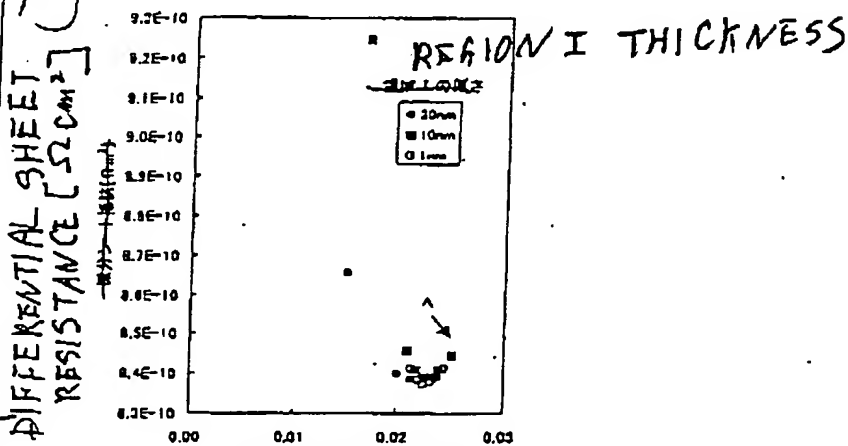
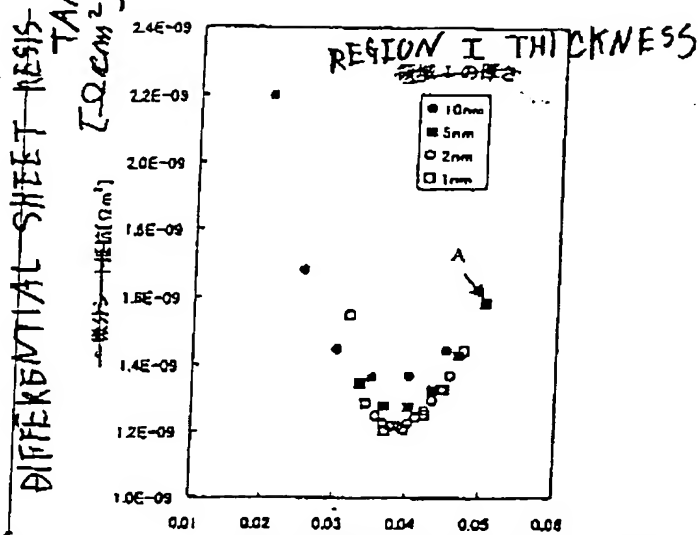


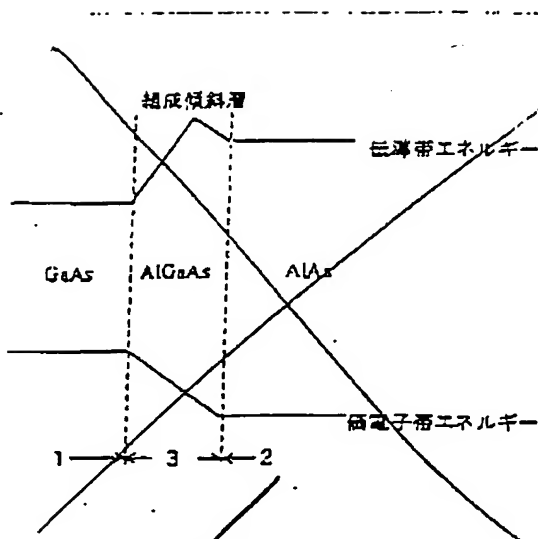
F1G12

~~[FIG 10]~~

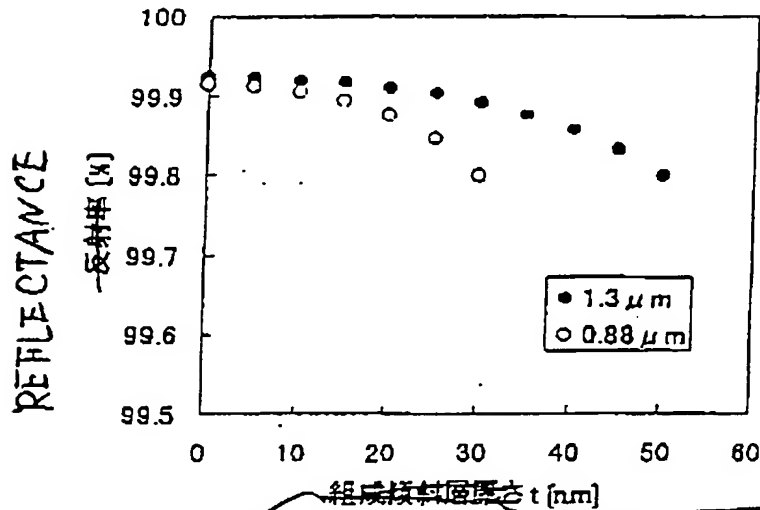
209220 "4058001
10085204" 022602

FIG 13





(図4) [2/16] FIG 16

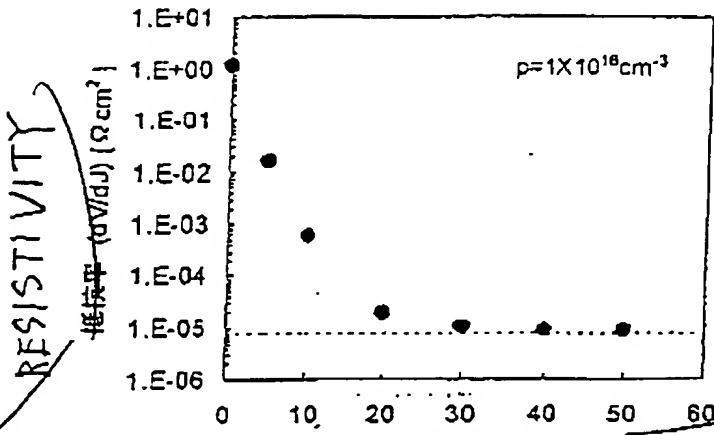


(図5)

GRADIENT LAYER THICKNESS

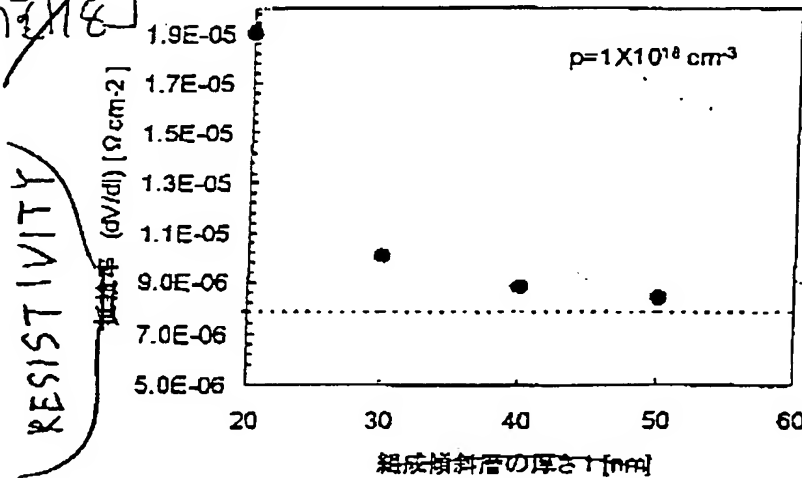
209220 4025802 10085204 022602

[17] — FIG 17



組成傾斜層の厚さ t [nm]
COMPOSITIONAL GRADATION LAYER THICKNESS
 t [nm]

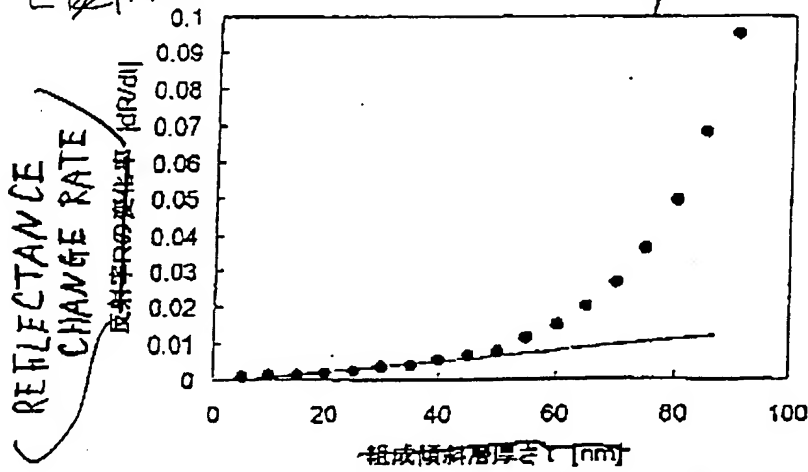
FIG 18



COMPOSITIONAL GRADATION LAYER
THICKNESS t [nm]

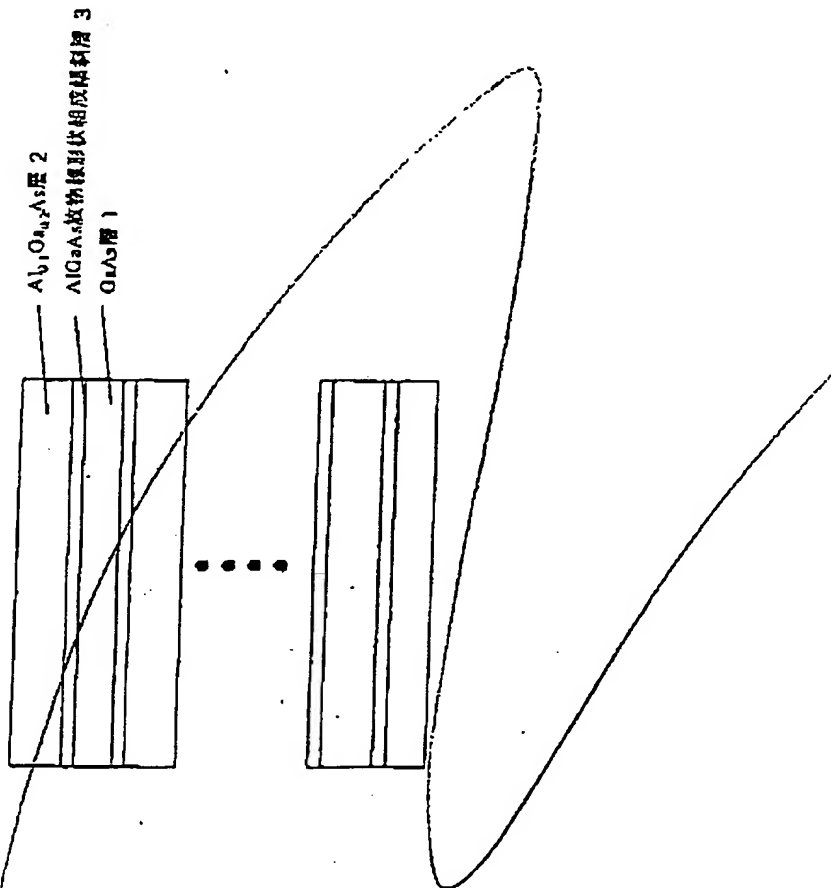
209220 40258007 10085204 022602

FIG-19



COMPOSITIONAL GRADATION LAYER THICKNESS [nm]

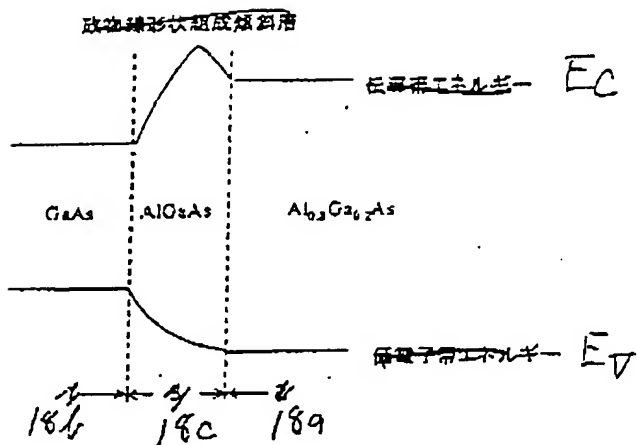
【図 8】



209220" 40258001

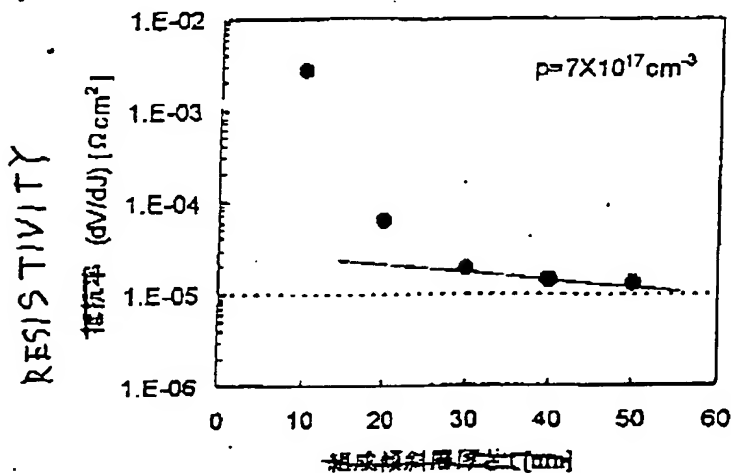
[図20]

FIG20



[図21]
[図18]

FIG21



COMPOSITIONAL GRADATION LAYER THICKNESS

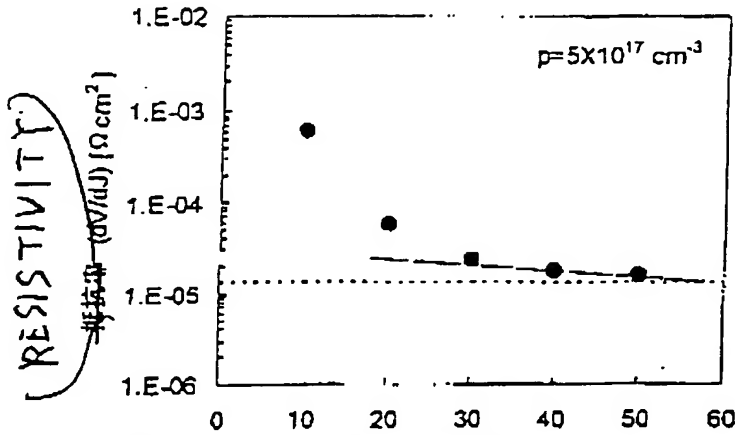
[μm]

[図11]

10085204.022602

[12] 22

FIG 22



[13] 23

COMPOSITIONAL GRADATION LAYER THICKNESS [mm]

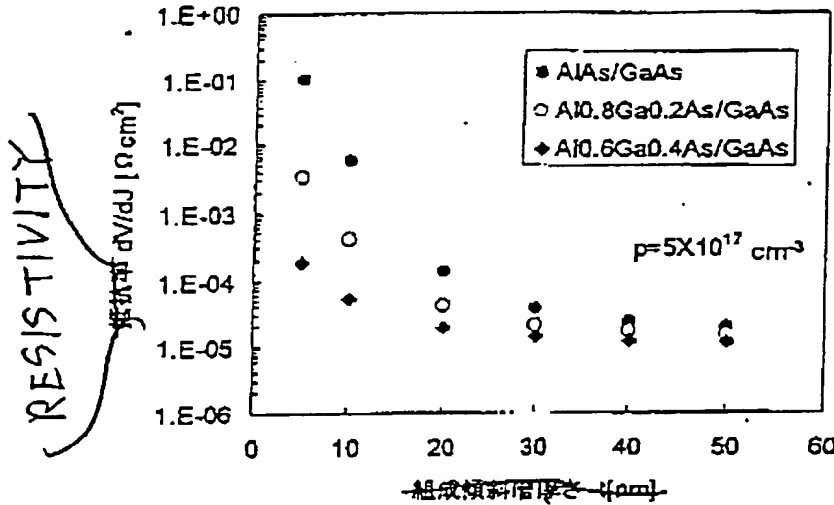


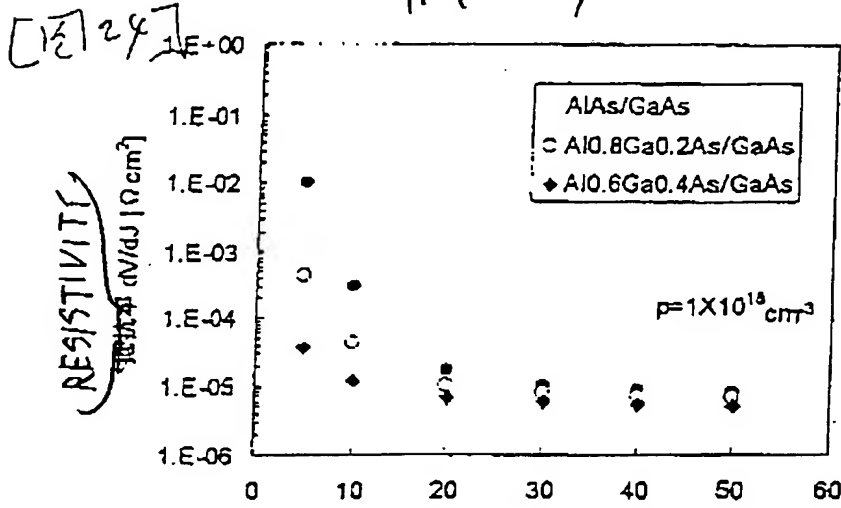
FIG 23

[13]

COMPOSITIONAL GRADATION LAYER THICKNESS [mm]

209220 4025802 10085204 022602

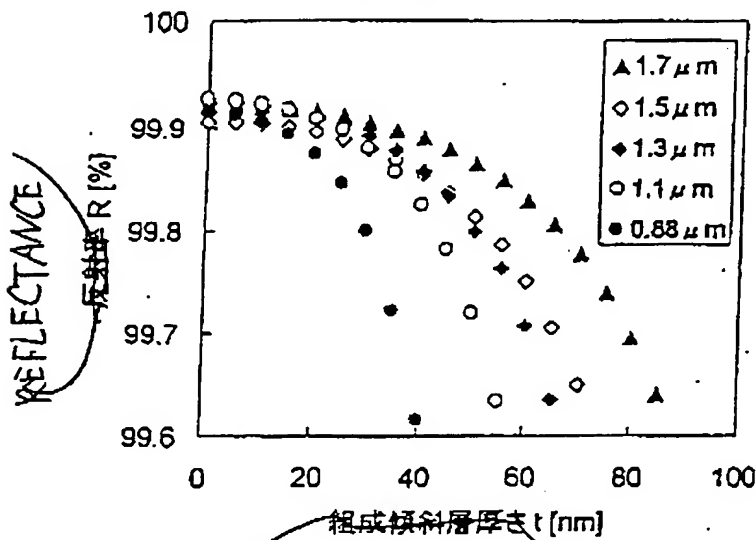
FIG 24



[FIG 25]

COMPOSITIONAL GRADATION LAYER THICKNESS

FIG 25



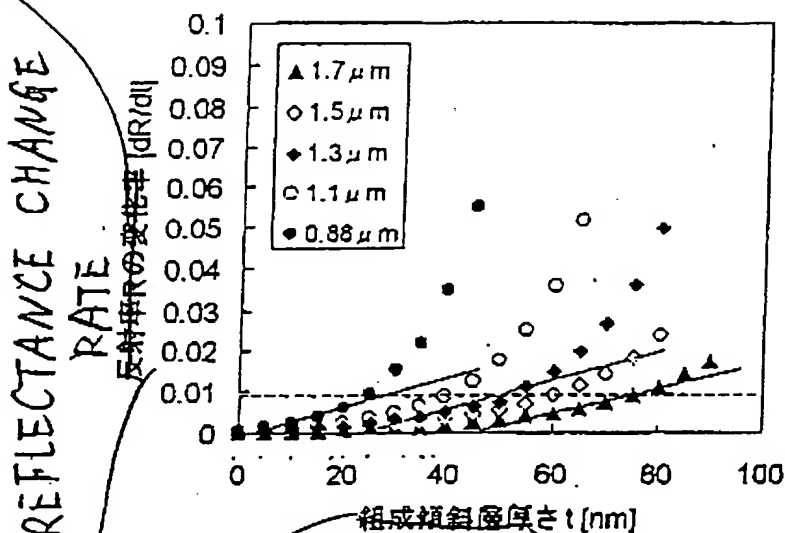
COMPOSITIONAL GRADATION LAYER THICKNESS

[FIG 15]

209220-40258001

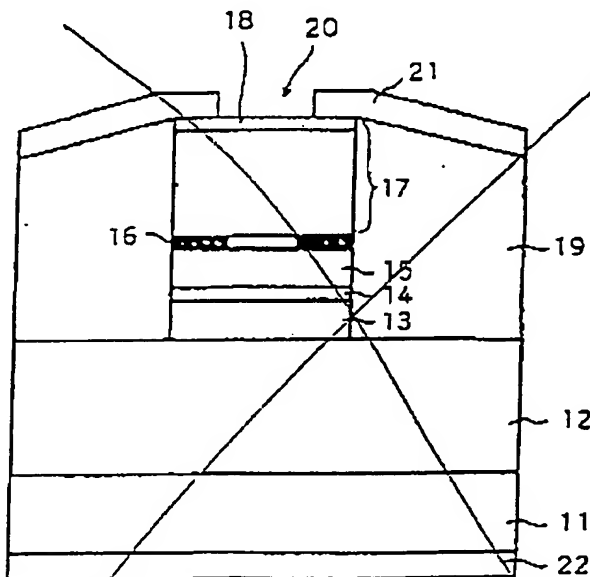
[FIG 26]

FIG 26



COMPOSITIONAL GRADATION LAYER THICKNESS

[FIG 16]



[FIG 17]

209220"40258001

FIG 27

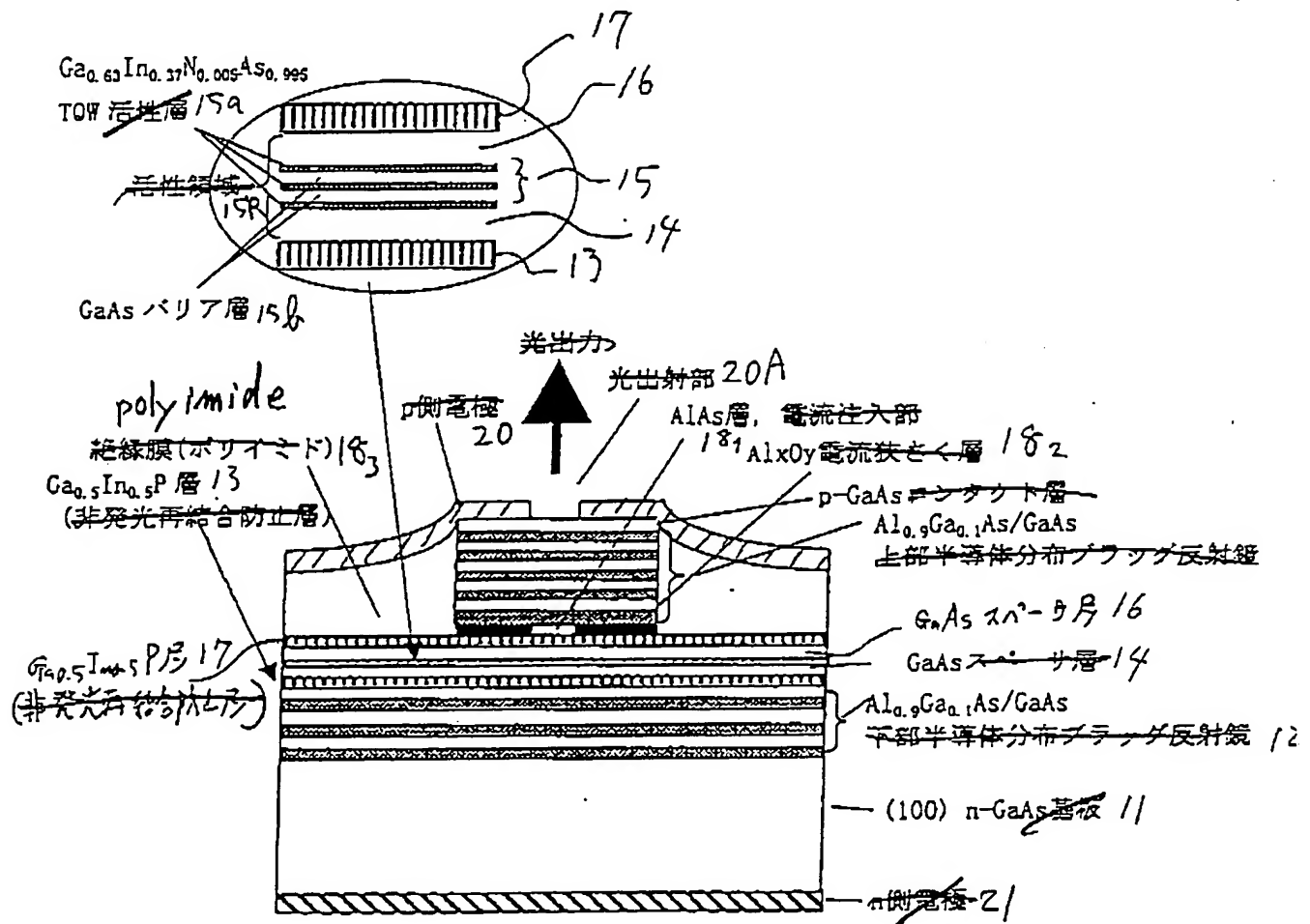


图 10

100504 102030

28
~~[12/18]~~

FIG 28

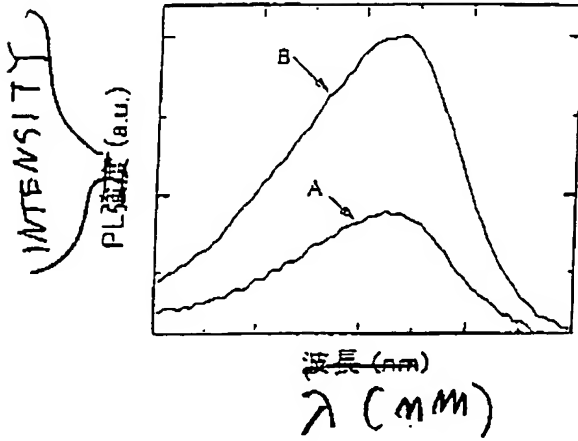


図 1 1

29
~~[12/18]~~

FIG 29

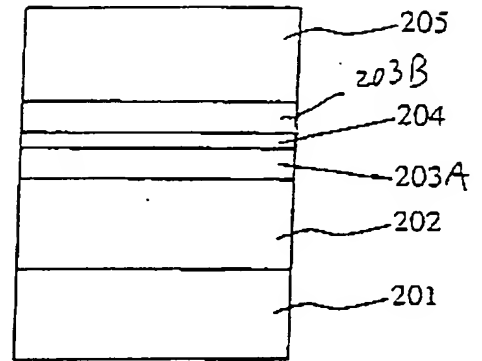


図 1 2

30
~~[12/18]~~

FIG 30

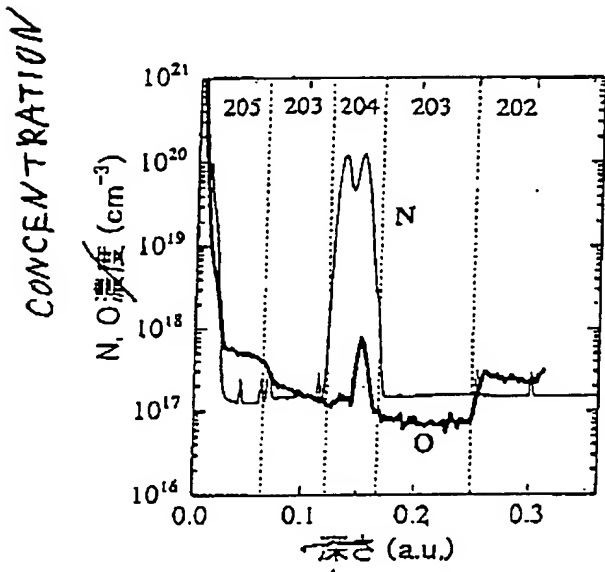
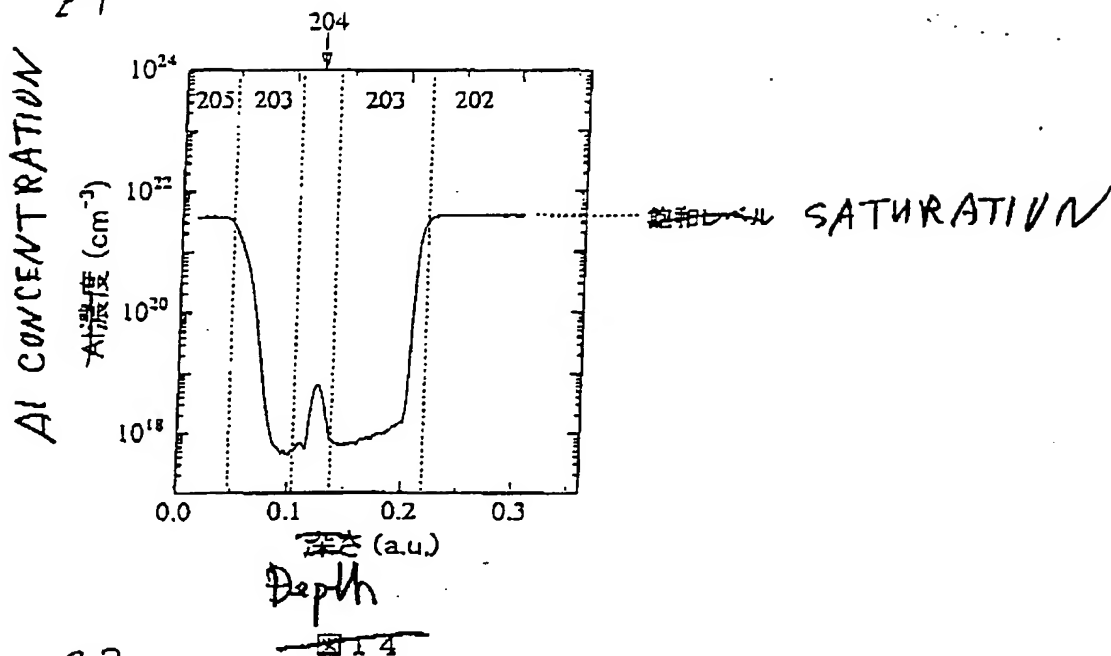


図 1 3

209220" 40258001

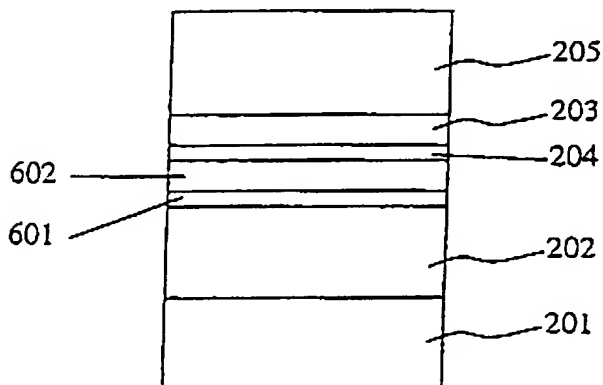
[~~FIG 31~~]
 31

FIG 31



[~~FIG 32~~]
 32

FIG 32



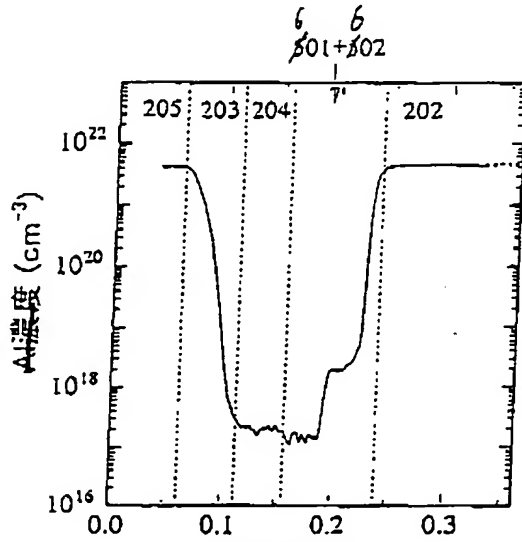
[~~FIG 32~~]
 32

10085204, 022602

33
[~~図 16~~]

F/G 33

Al CONCENTRATION



飽和レベル

SATURATION

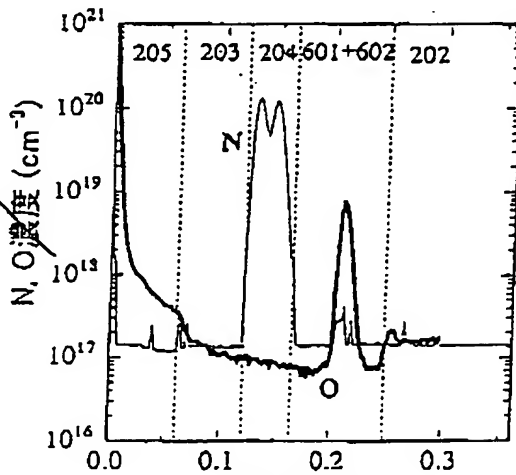
Depth

~~図 16~~

34
[~~図 17~~]

F/G 34

CONCENTRATION



Depth

~~図 17~~

209220" 40258001

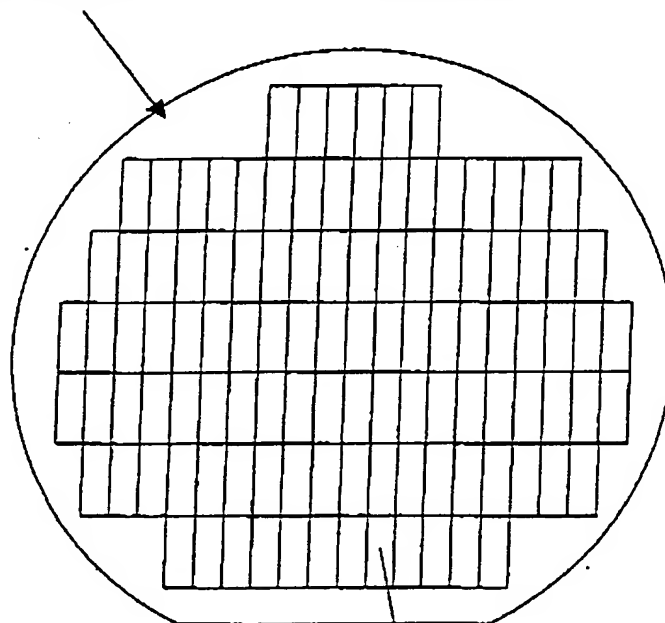
1008504 022600

3

35
☒ 18 ☐

FIG 35

~~ドーパントを形成した (100) n-GaAs ウェハ~~ 31



~~ドーパントタイプ~~ 32

図 18

10085204, 022602

36
~~[図 18]~~

H1G36

33

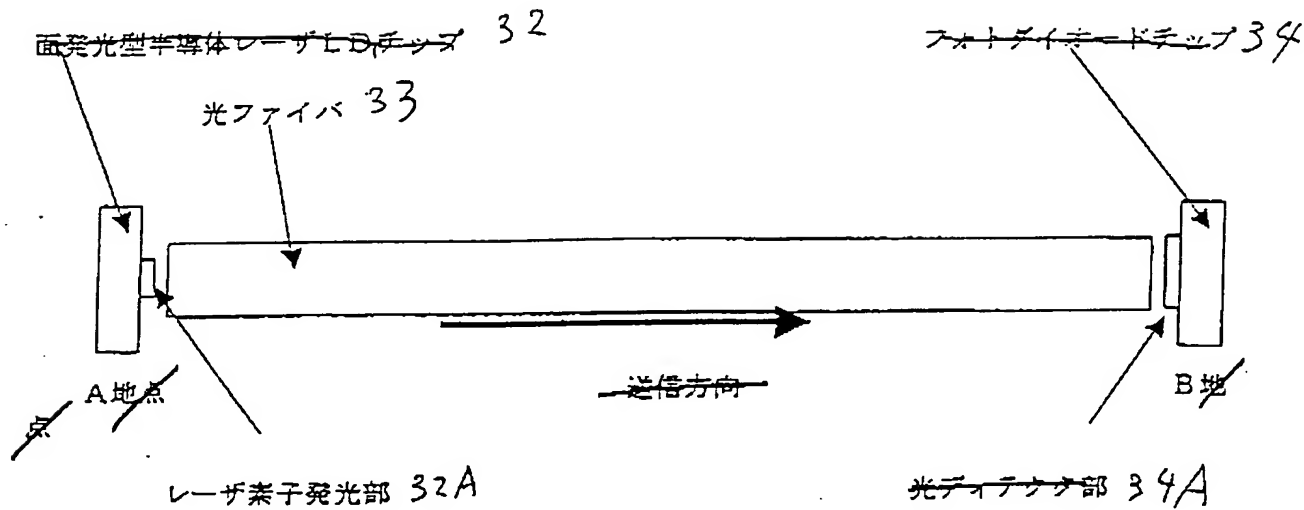


図 19

37
~~[図 20]~~

H1G37

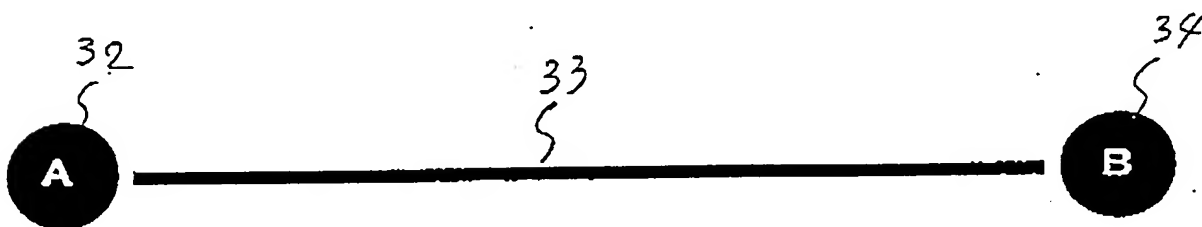


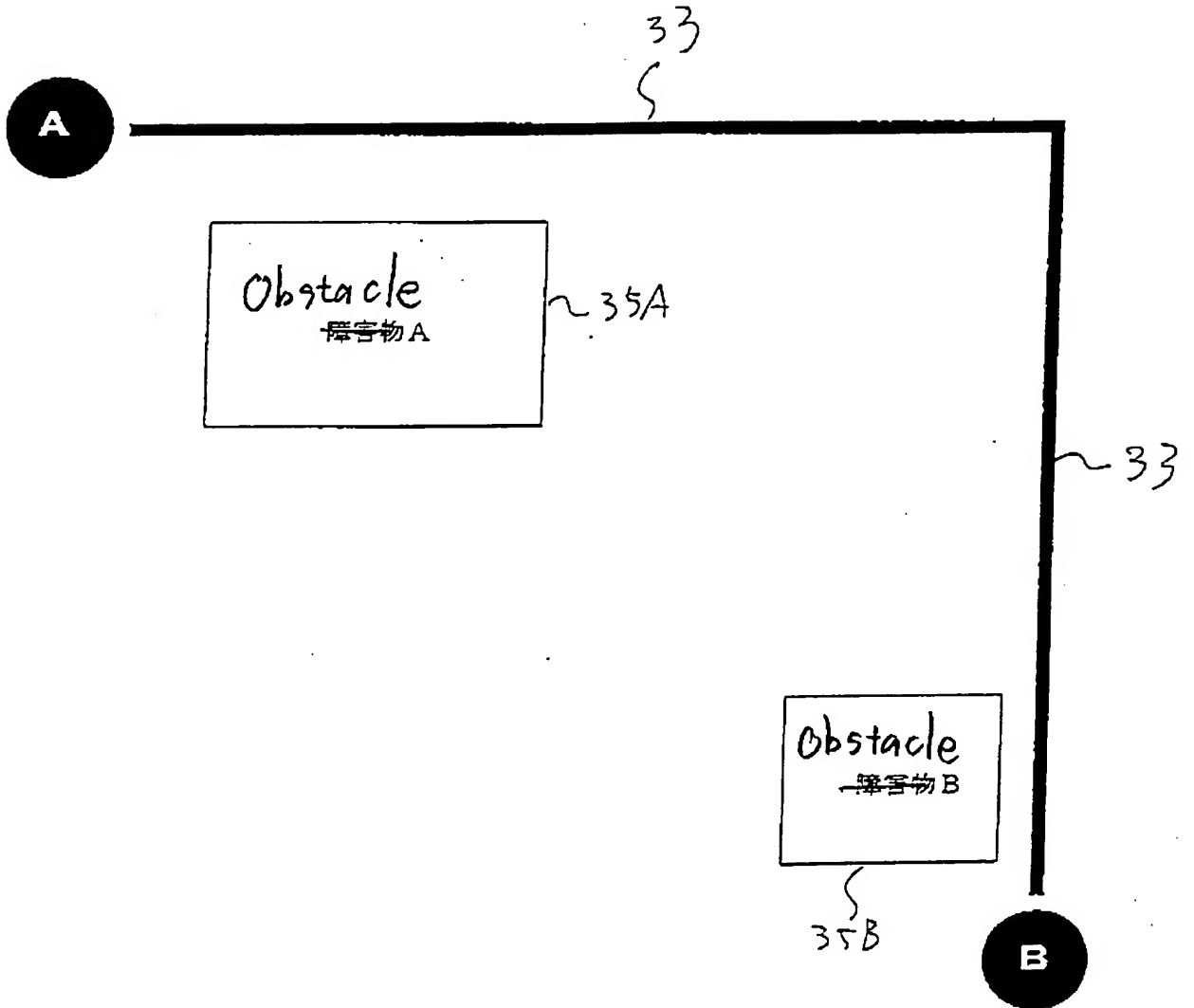
図 20

10085204-022602

43

38
[21]

FIG 38

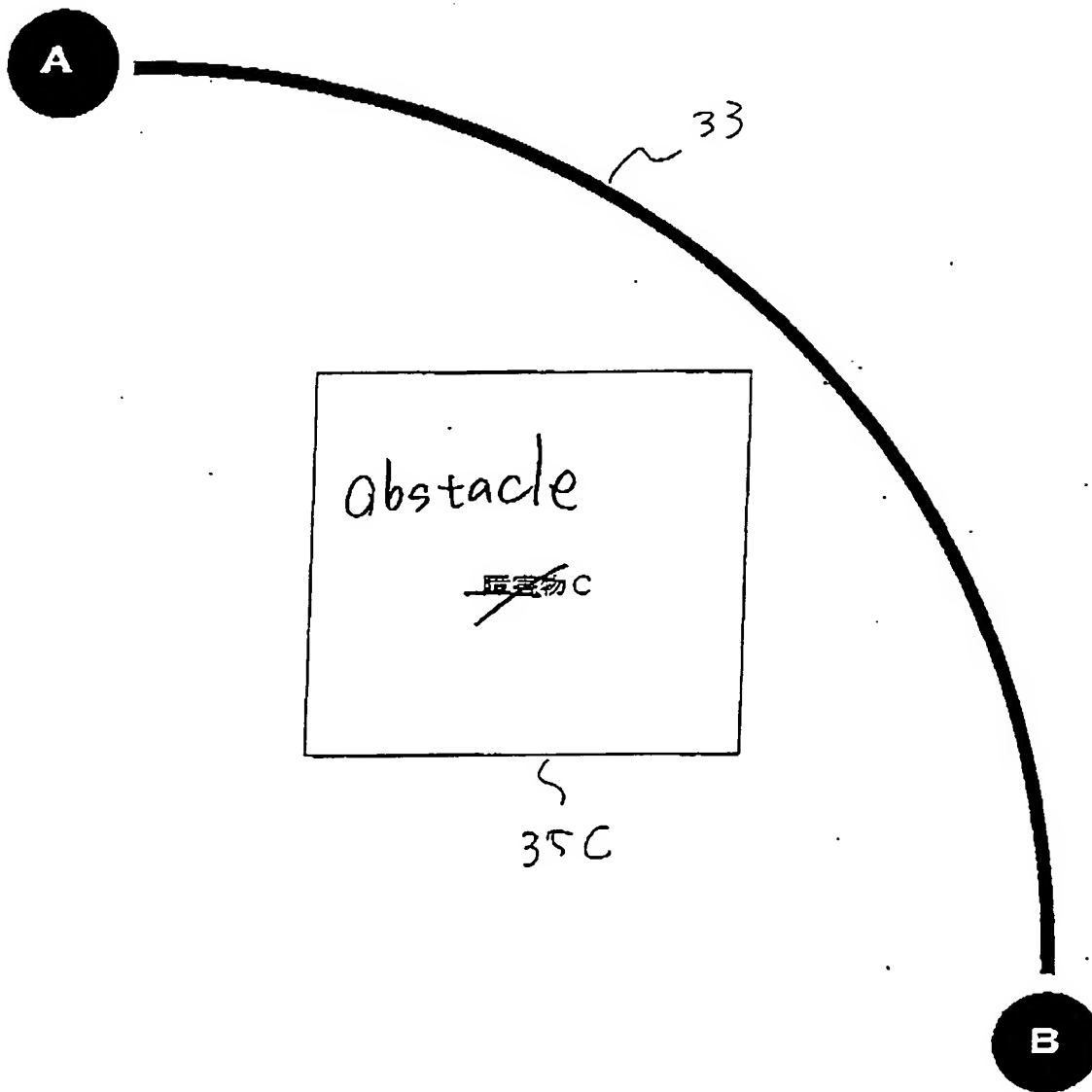


10085204.022602

3

31
[13] 22

FIG 39

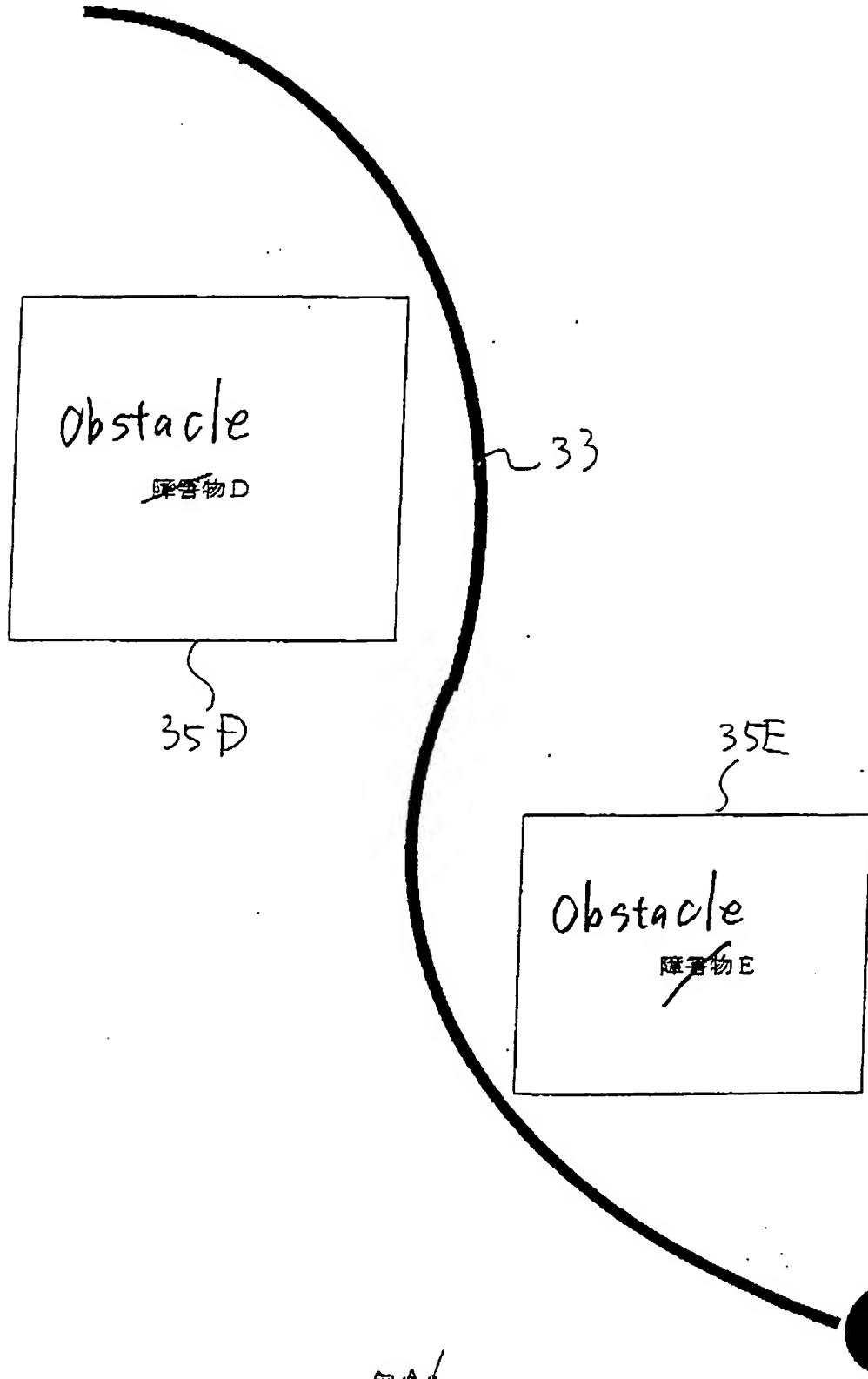


209220" 4025800T
10085204.022602

~~FIG 40~~

FIG 40

3



10085204.022602

~~FIG 40~~

4/
 □ 20

FIG 4/

9/4

面発光型半導体レーザユニット 32

光ファイバ F1

反射部材 R

半導体発光部 32A

送信方向

送信方向

光ファイバ F2

光ファイバ受光部 34A

フォトダイオードユニット 34

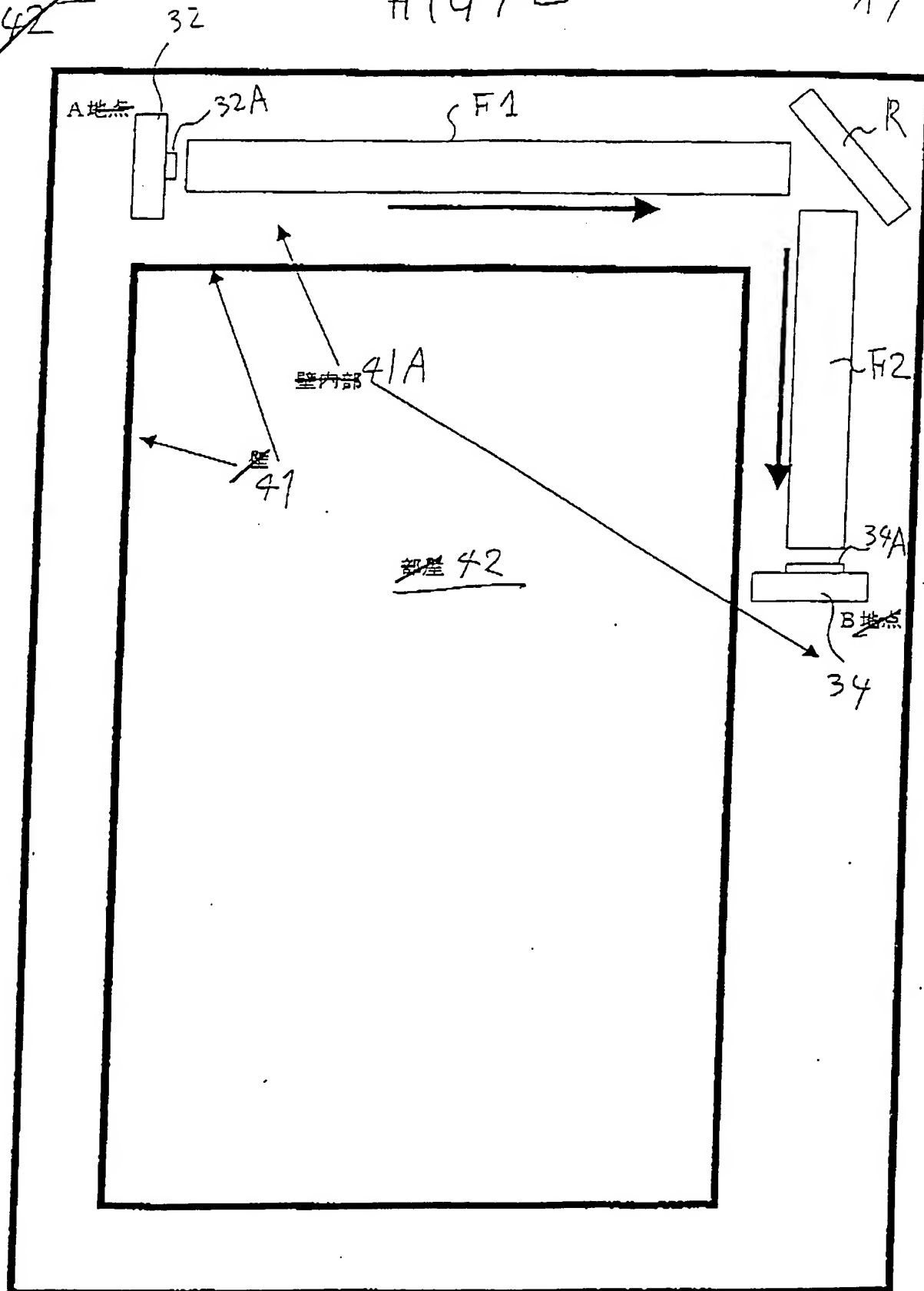
図 2

10085204.022602

L181 42
42

HIG42

44



10085204, 022602

A21

□ 26/ □
43

F/G 43

44

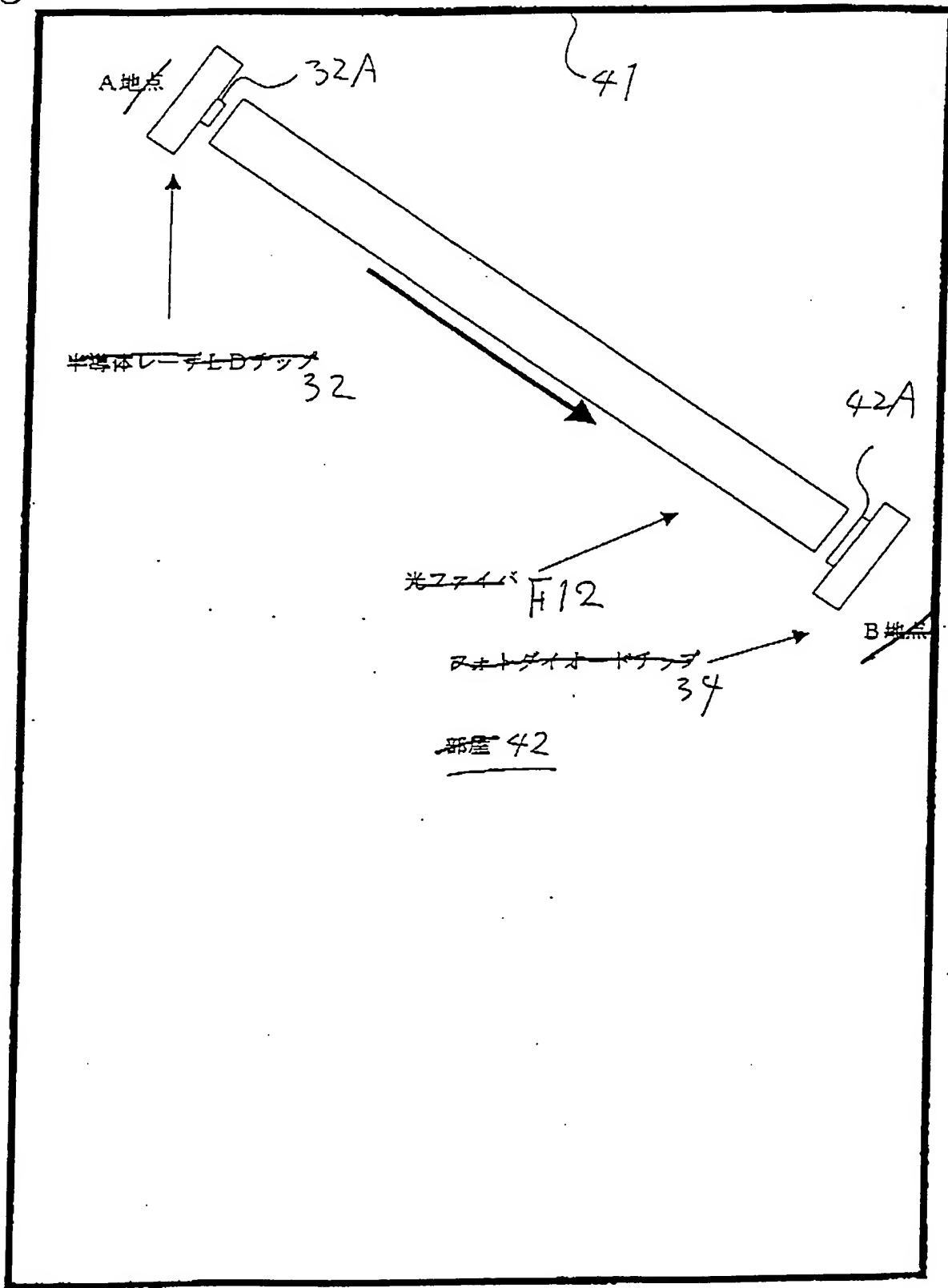


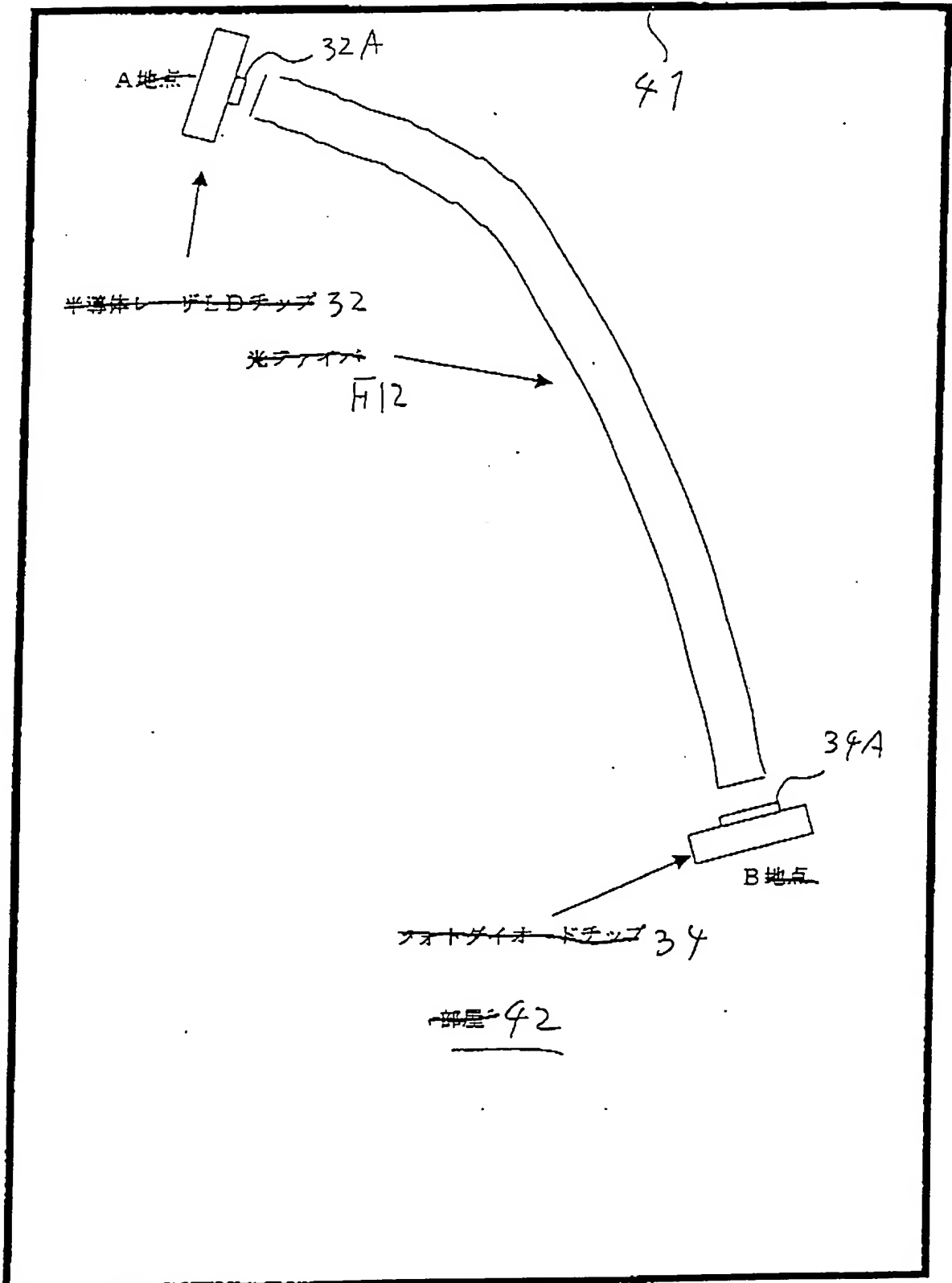
図 26

10085204.022602

18127
 44

FIG 44

カ



10085204, 022602

27

45
 45
 45

FIG 45

44

面発光型半導体レーザーチップ 32

フォトダイオードチップ 34

レーザー発光部 32A

光検出部 34A

送信方向

46
 46
 46

面発光型半導体レーザーチップ 32

反射部材 R

FIG 46

送信方向

レーザー発光部 32A

送信方向

光検出部 34A

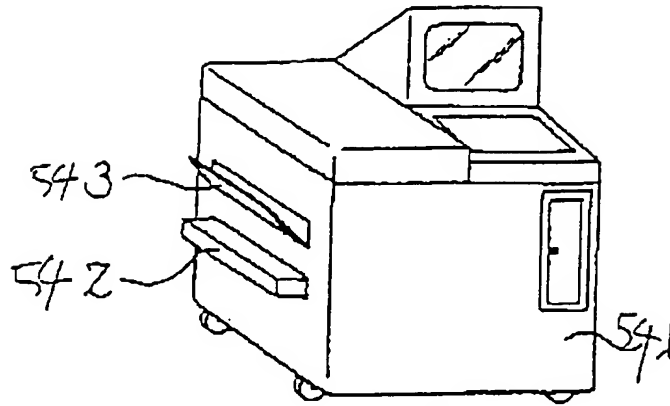
フォトダイオードチップ 34

2.9
 1a

10085204.022602

~~47~~
~~[280]~~ F/G47

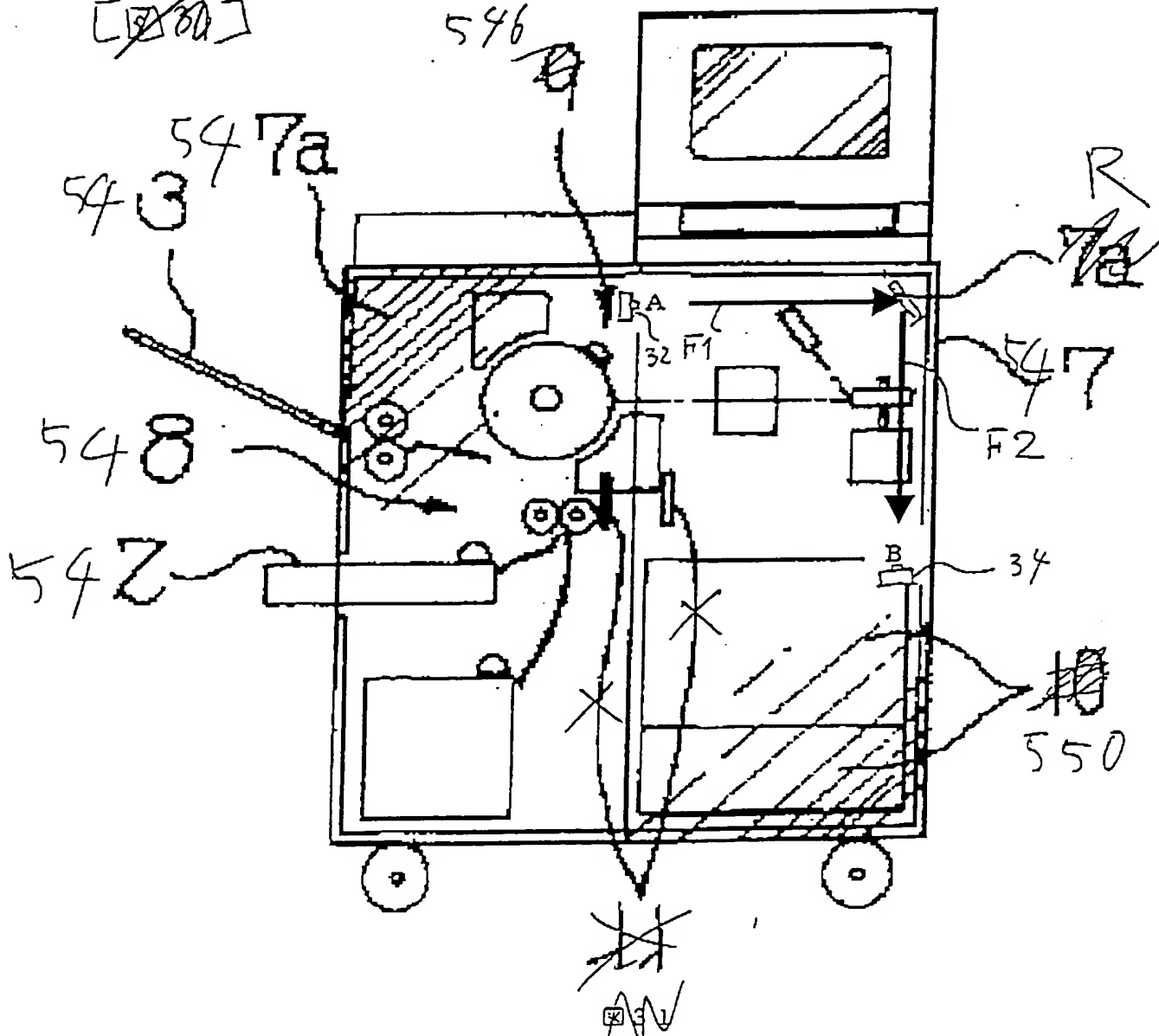
15



F/G48

~~48~~
~~[280]~~

546



10085204.022602

49
~~[12/32]~~

45

FIG 49 551

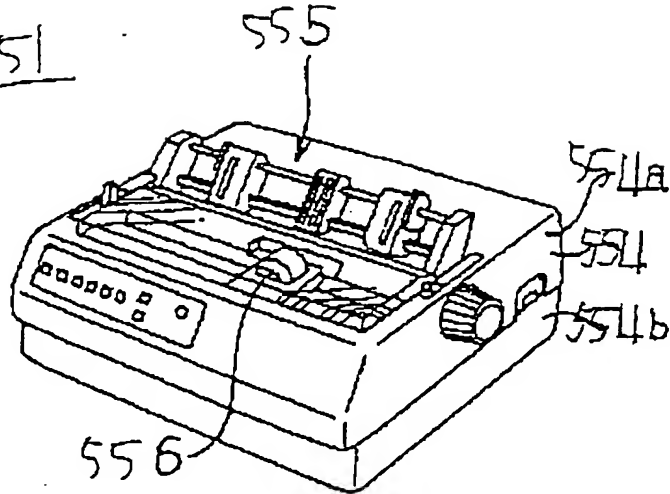
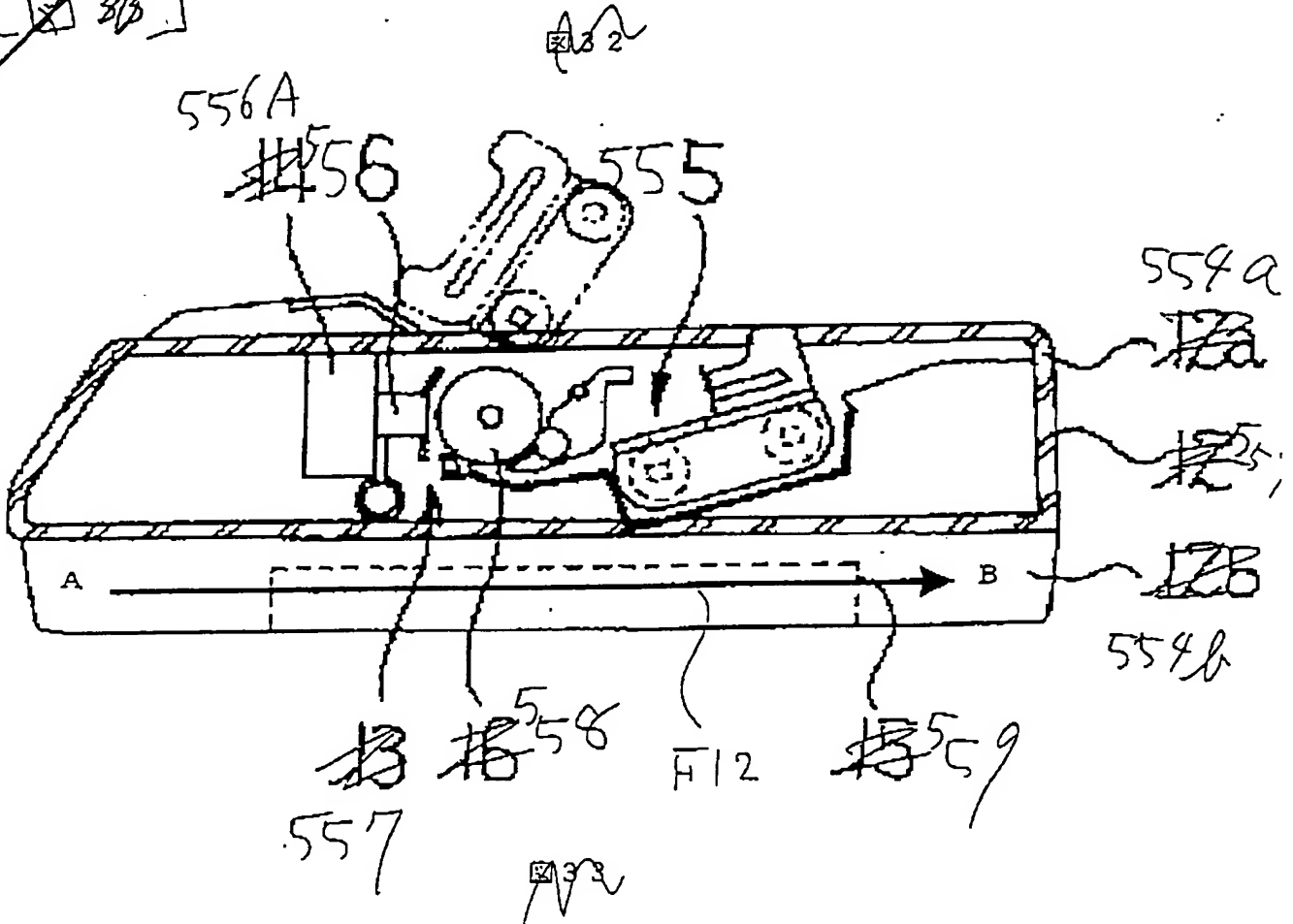


FIG 50

50
~~[12/33]~~



10085204.022602

6

51
~~FIG 34~~

FIG 51

面発光型半導体レーザーLDチップ 32

反射部材 R

カバー 32B

送信方向

F1

レーザー発光部 32A

A

送信方向

F2

カバー 34B

光アイソレータ部 34A

フォトダイオードチップ 34

34

B

~~FIG 34~~

10085204.022602

54
~~35~~

FIG 52

7
2

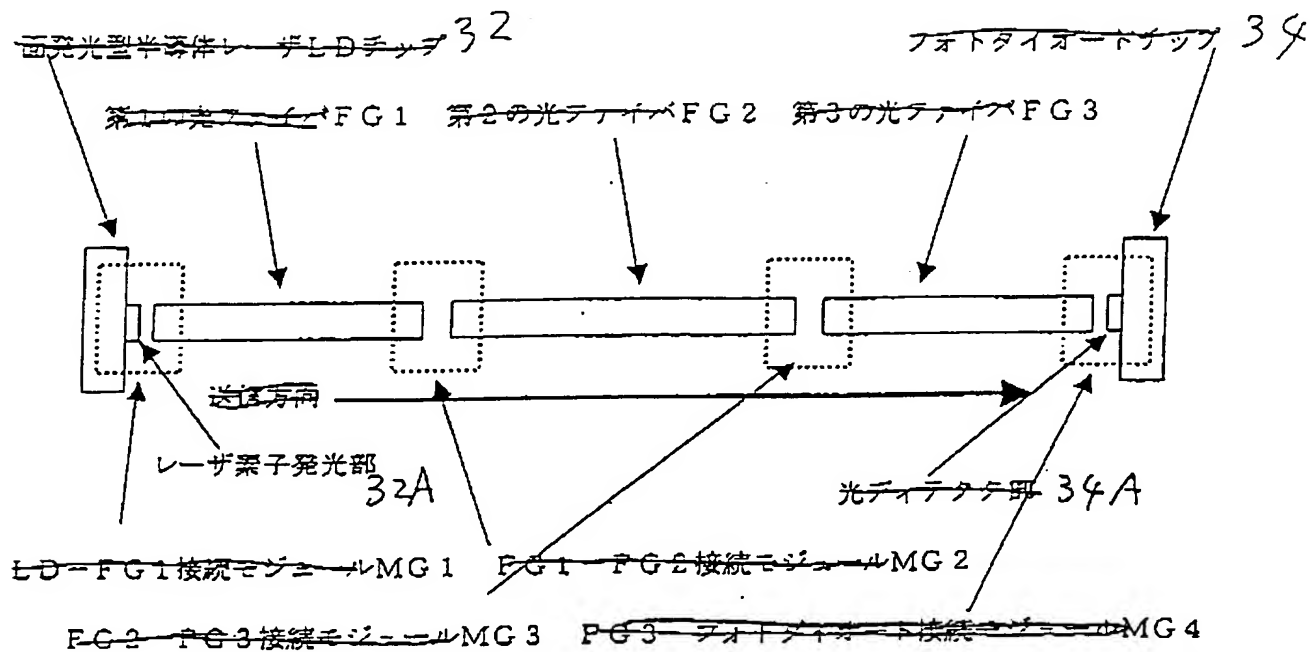


図 85

10085204.02602

図35

FIG 53

37

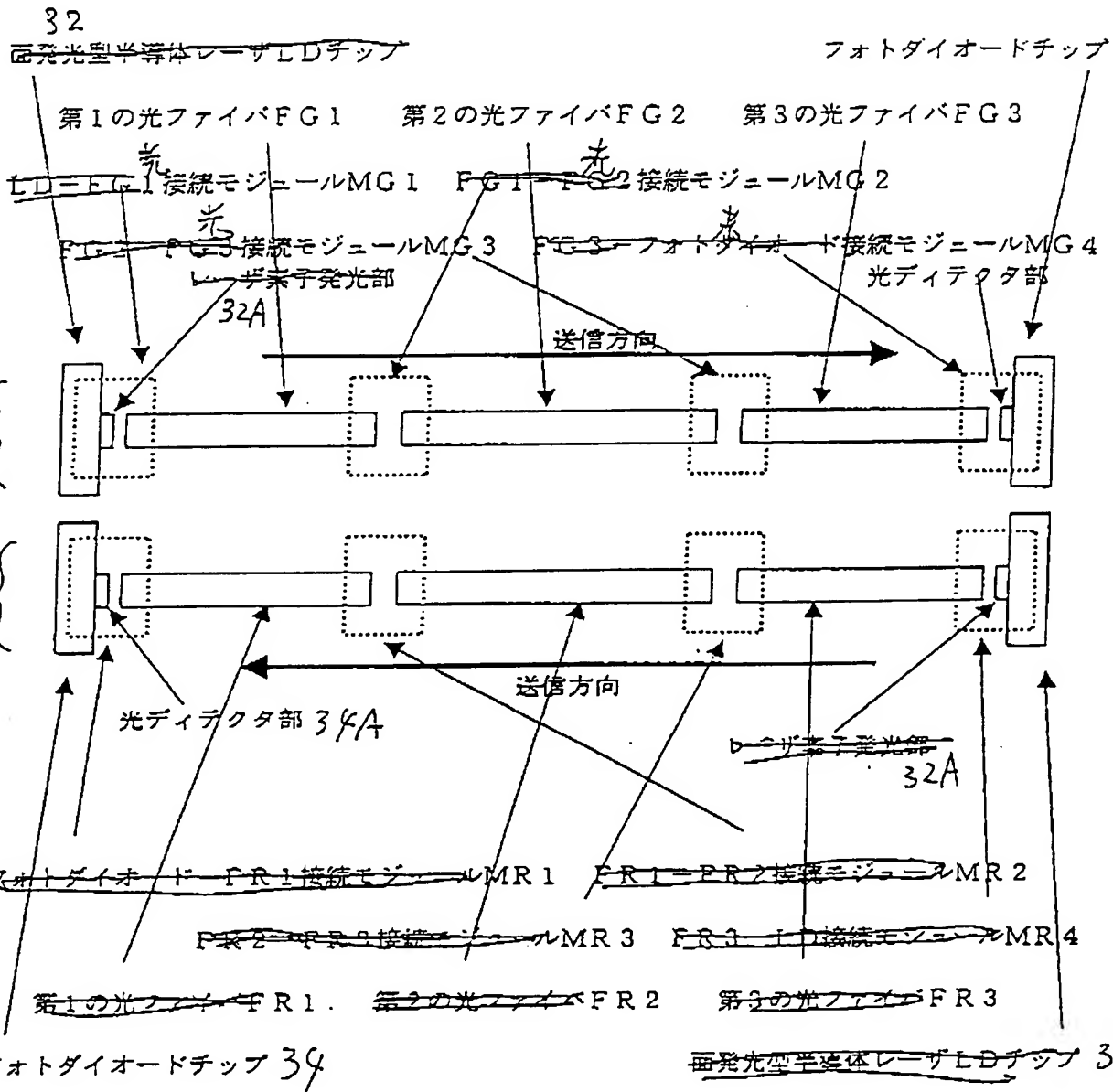


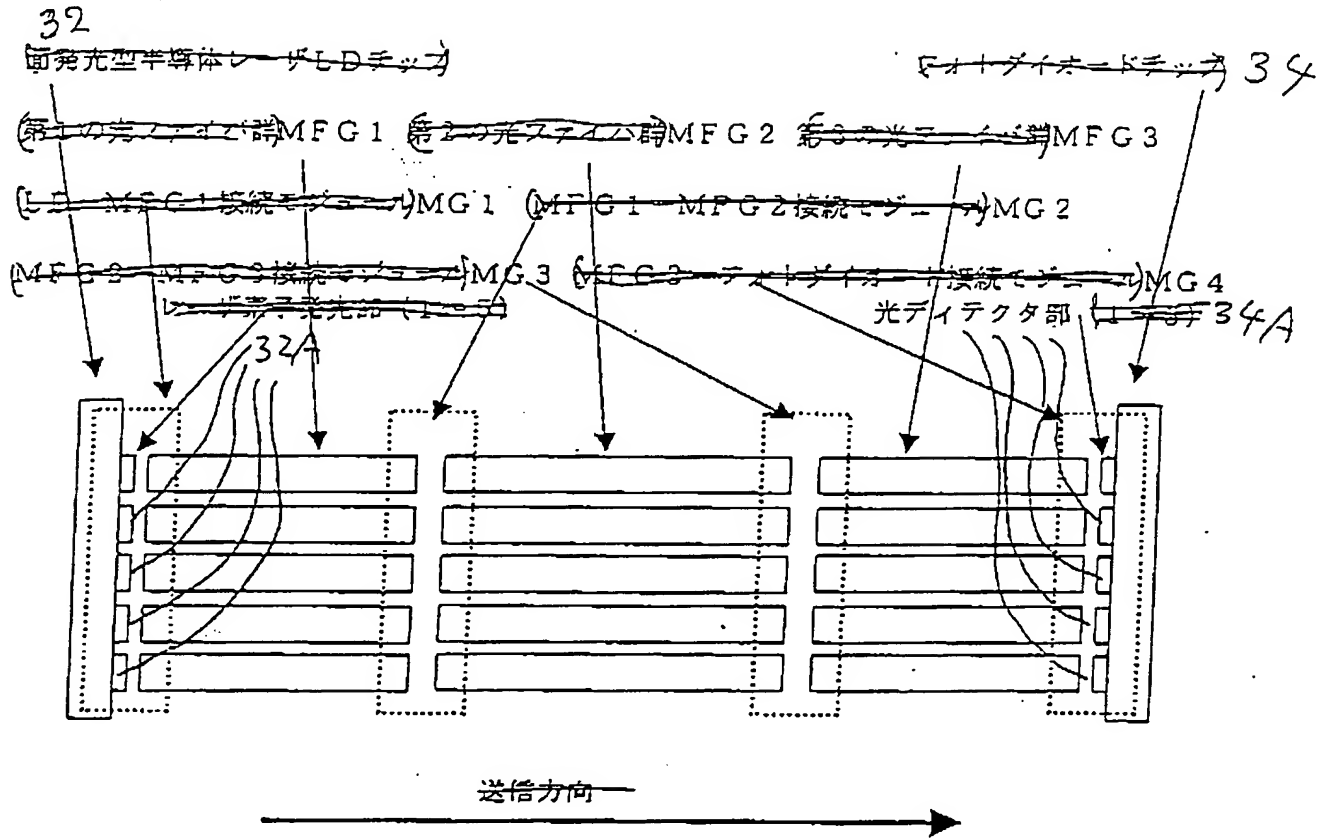
図35

10085204.022602

~~図 36~~

F1G54

カ



~~図 37~~

10085204, 022602

~~FIG 3/8~~

HIG 55

98

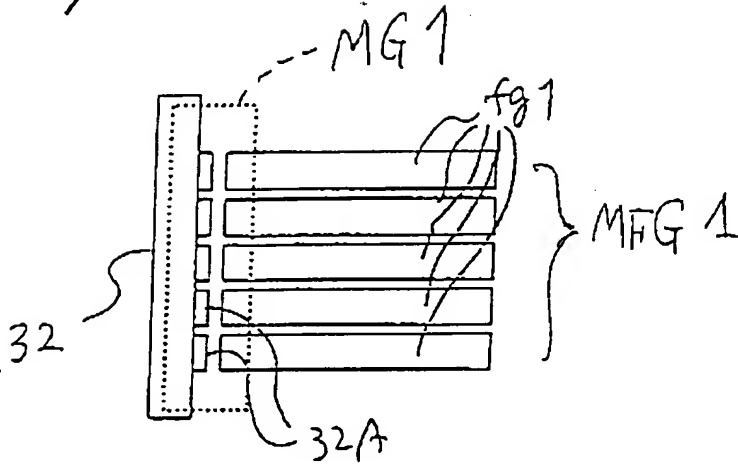


FIG 3/8

10085204, 022602

~~C12 35~~
56

FIG 56

カ8

LDテッポホルダ

ファイバホルダ

61

62

10085204, 022602

32

32A

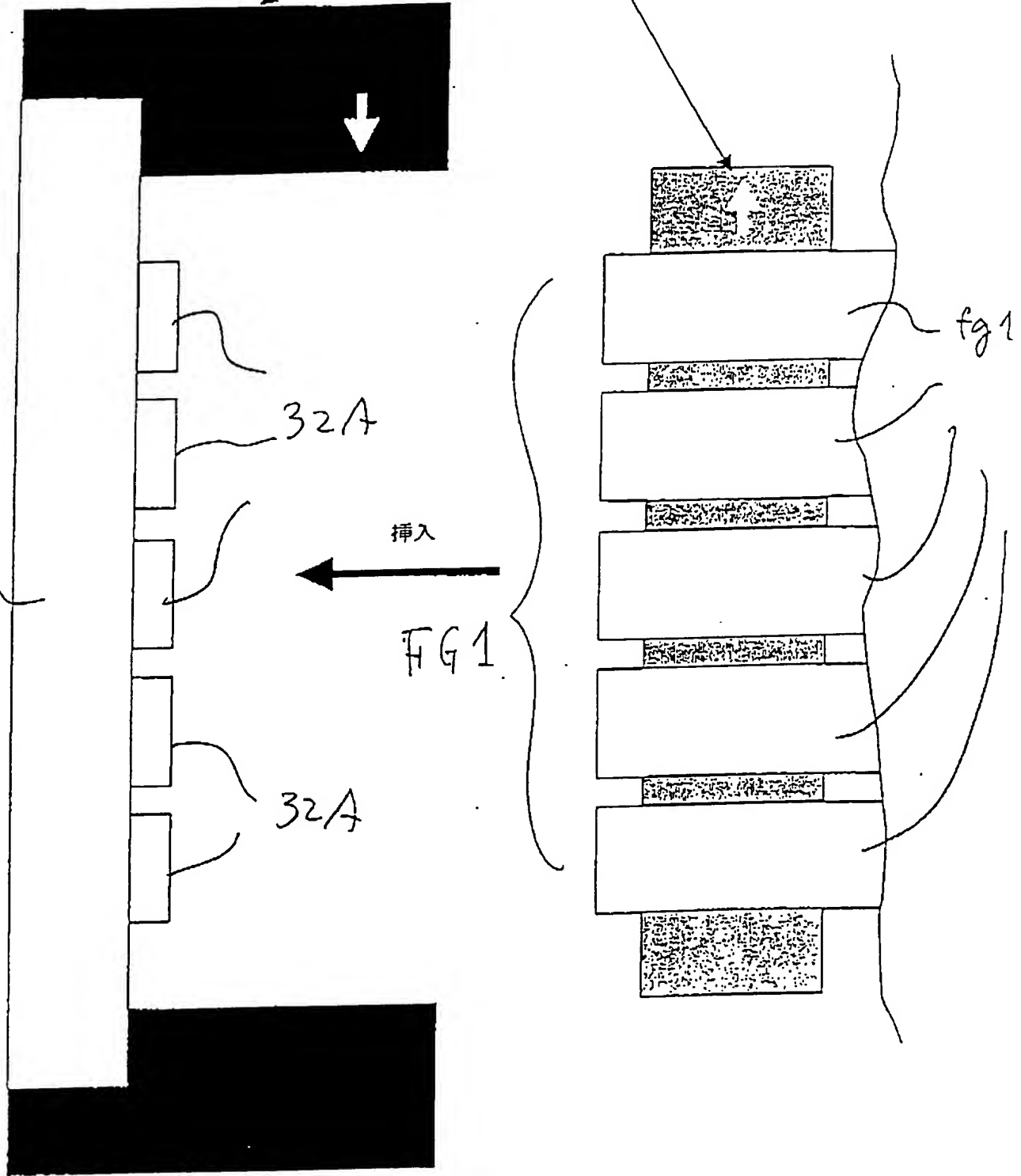
挿入

FG1

32A

fg1

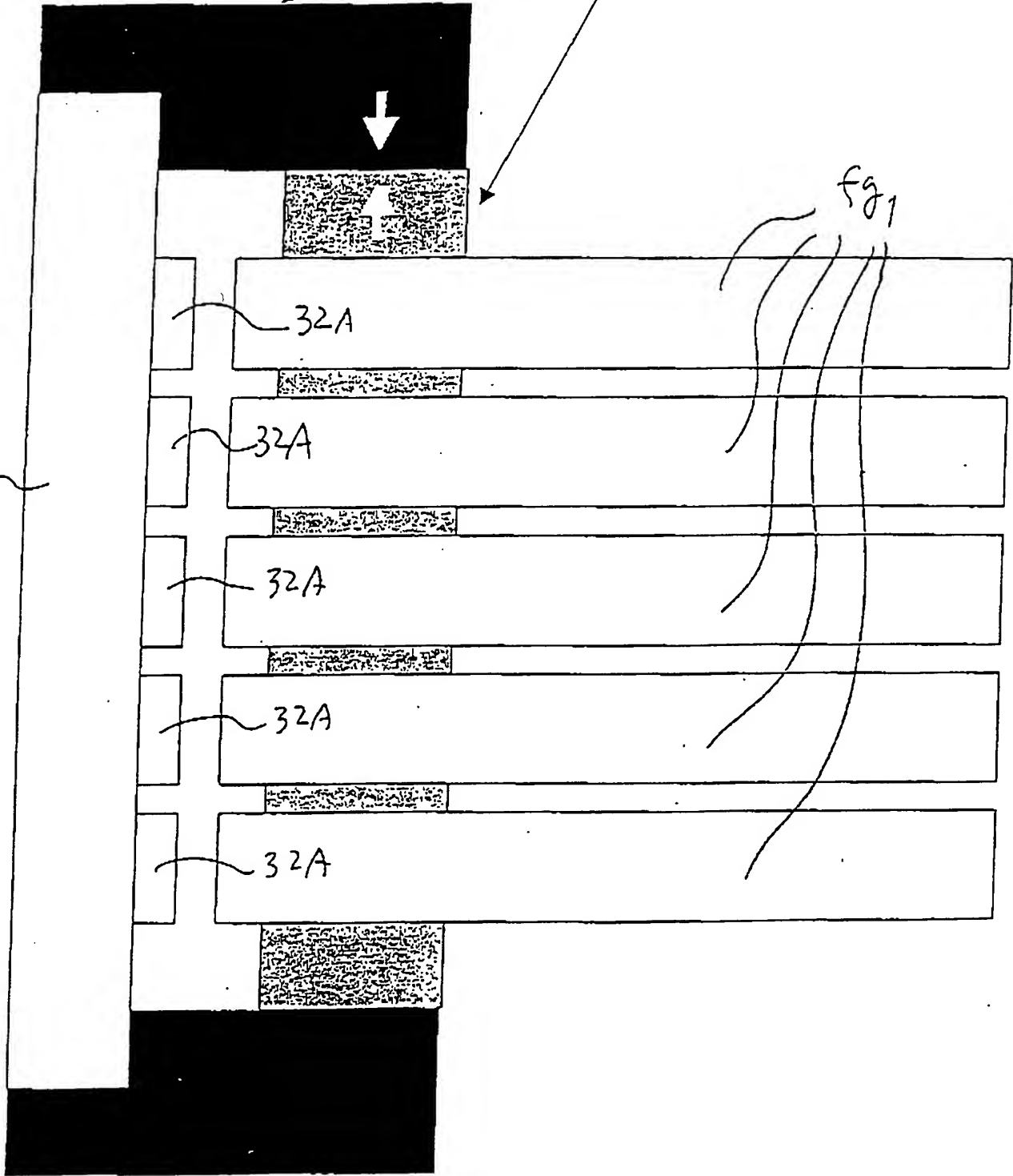
8/9



[13] 807 FIG 57

48

LDチップホルダ 61
ファイバホルダ 62



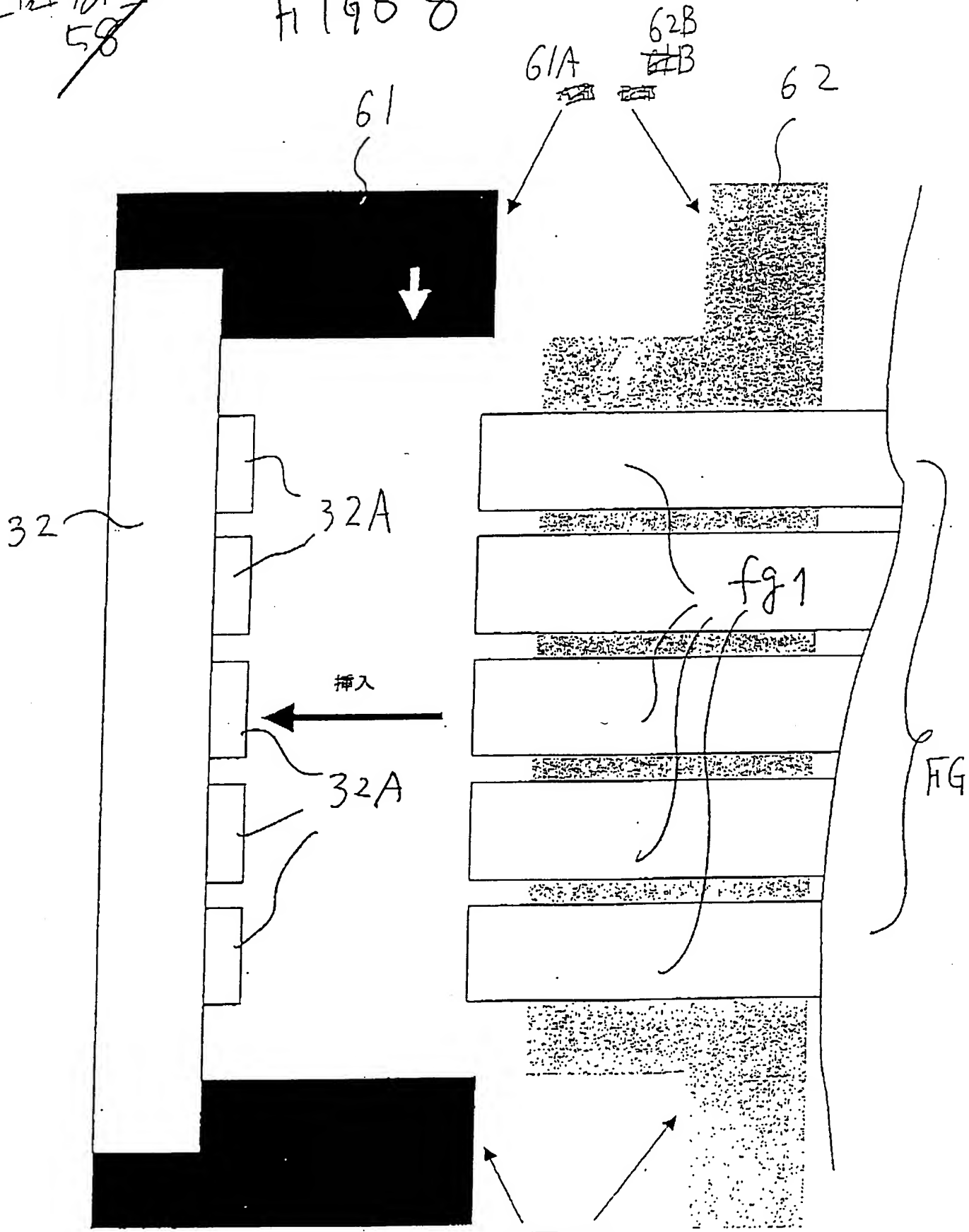
10085204 022602

40

~~FIG 58~~

FIG 58

8



~~FIG 58~~
 61A 62B

10085204.022602

A8

C12 127
59

FIG 59

61

62



fg 1

32A

32

MFG 1

Fig 2

10085204.022602

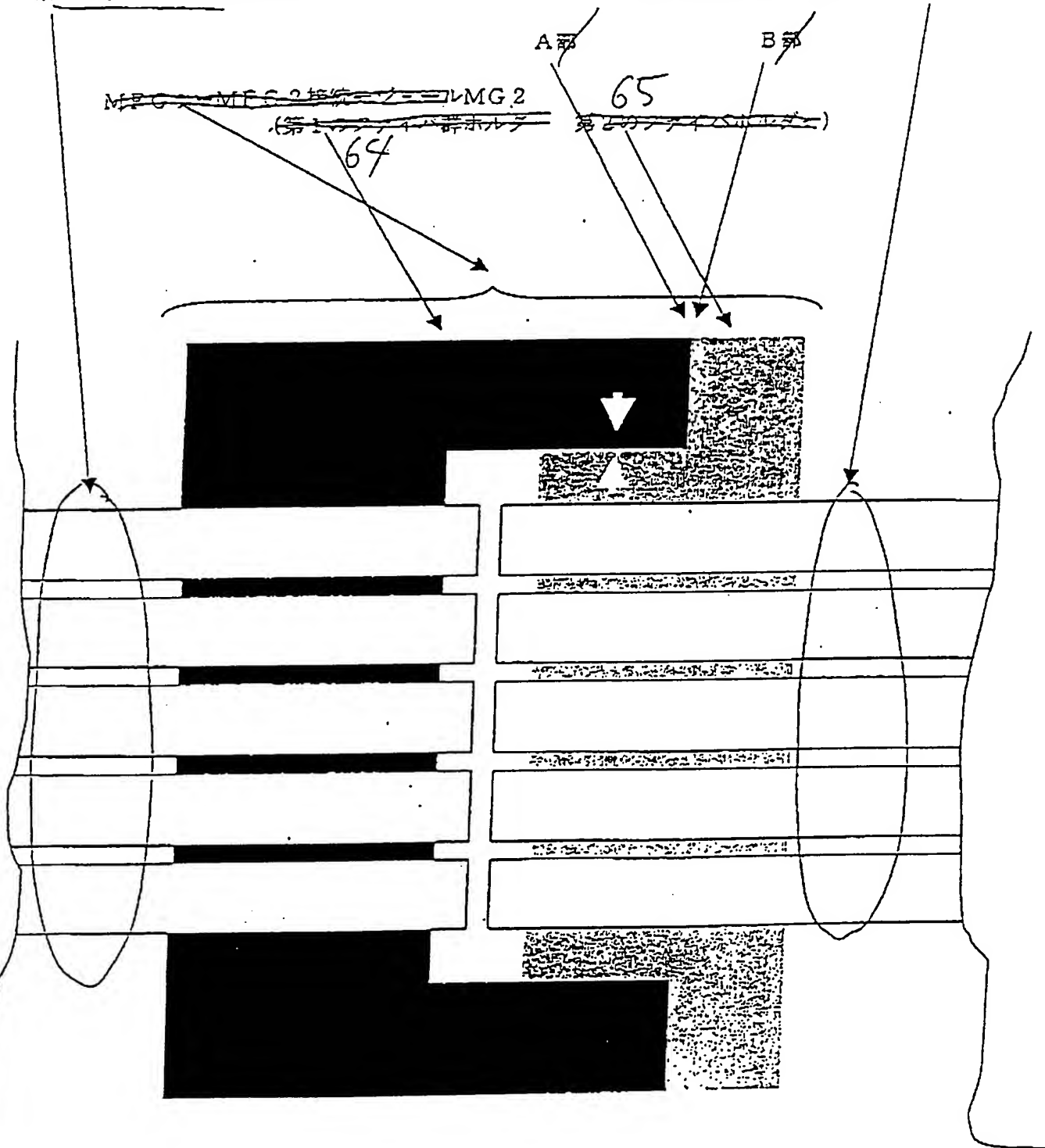
[12/18]
60

H1G60

カ8

第1の光ファイバ群MFG 1

第2の光ファイバ群MFG 2

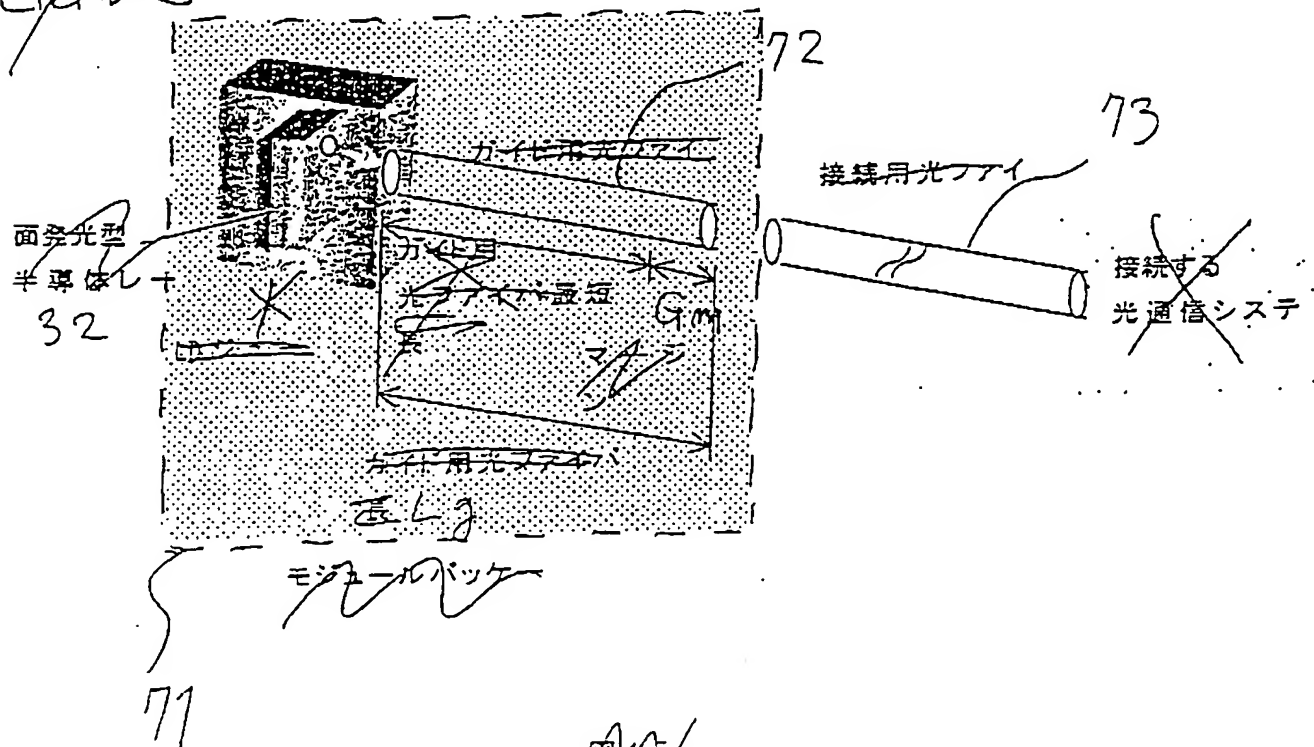


793

10085204.022602

H/G6/

49

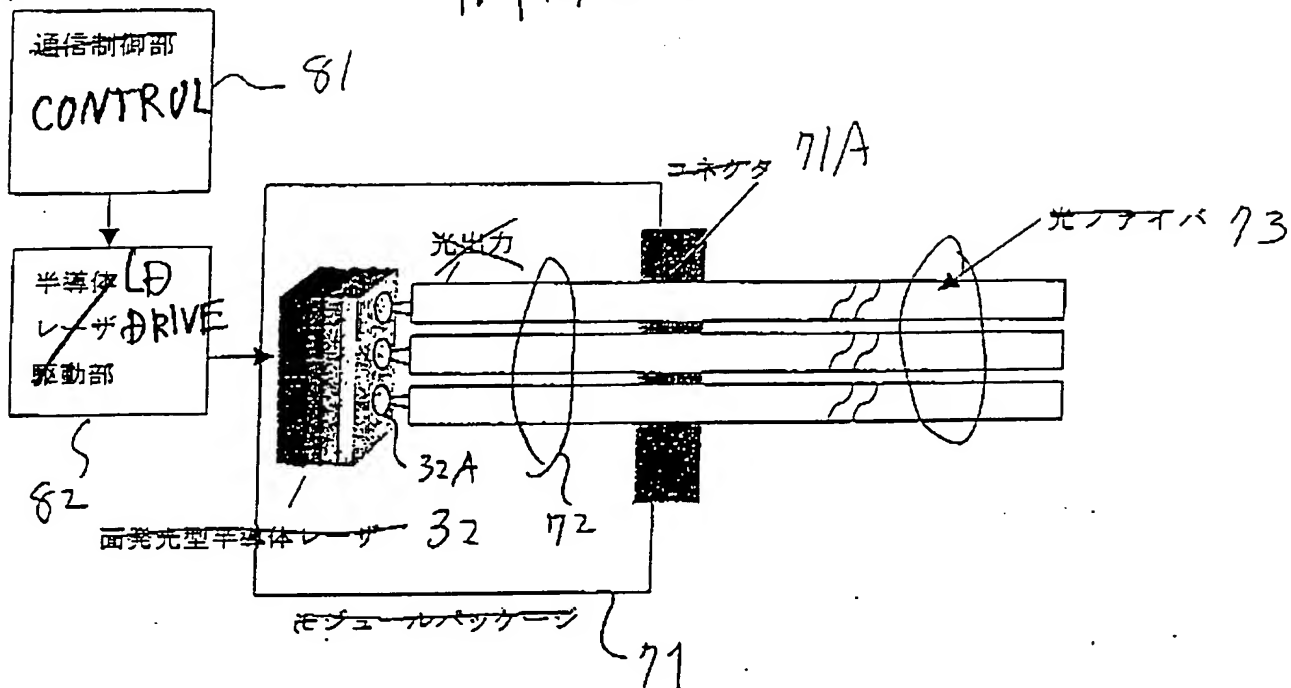


45 ✓

710

~~[12] 63~~

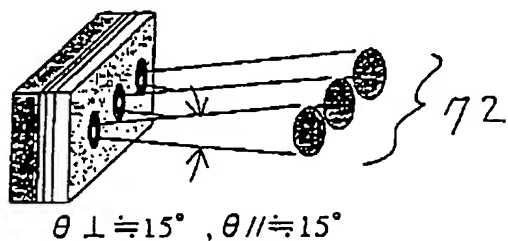
H1G63



46

~~[12] 64~~

H1G64



47

10085204.022602

~~[FIG 65]~~
~~65~~

FIG 65A
 (A)

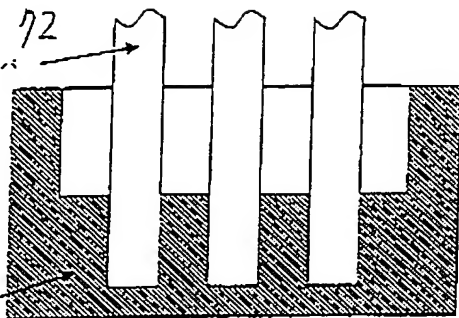


FIG 65C

FIG 10

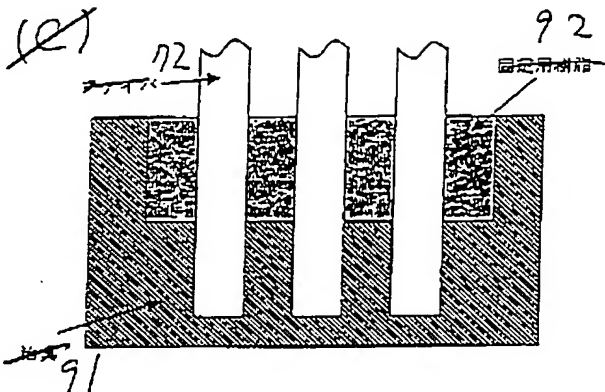
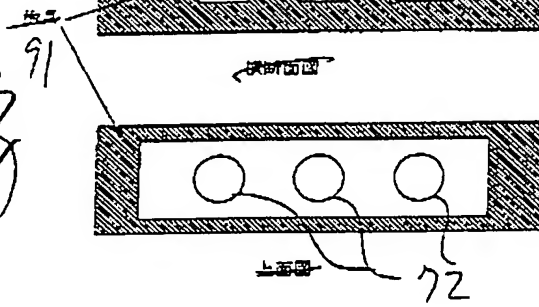


FIG 65B
 (B)



10085204, 022602

~~[FIG 66]~~
~~66~~

FIG 66A
 (A)

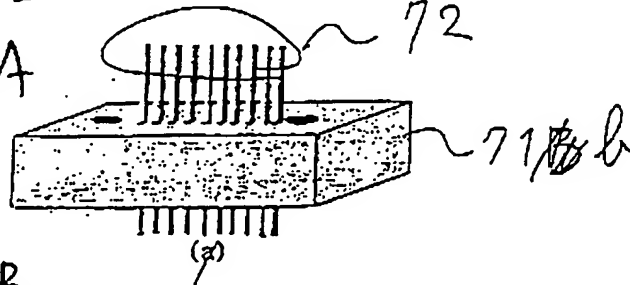


FIG 66B
 (B)

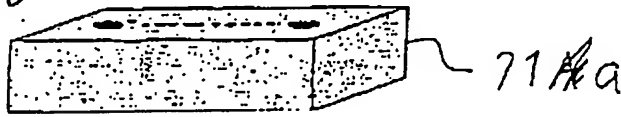
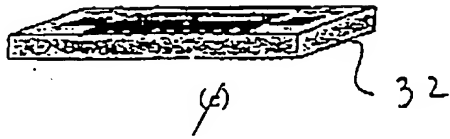


FIG 66C
 (C)



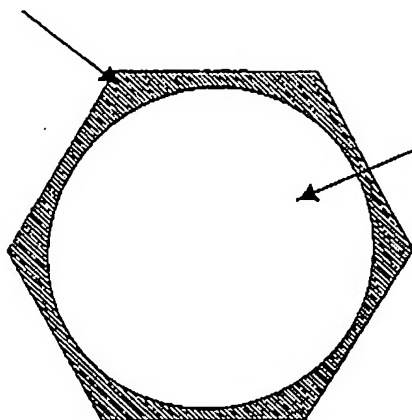
} 71A

710

~~FIG 67~~
~~FIG 67~~

FIG 67

樹脂 ~~埋入領域~~ 96

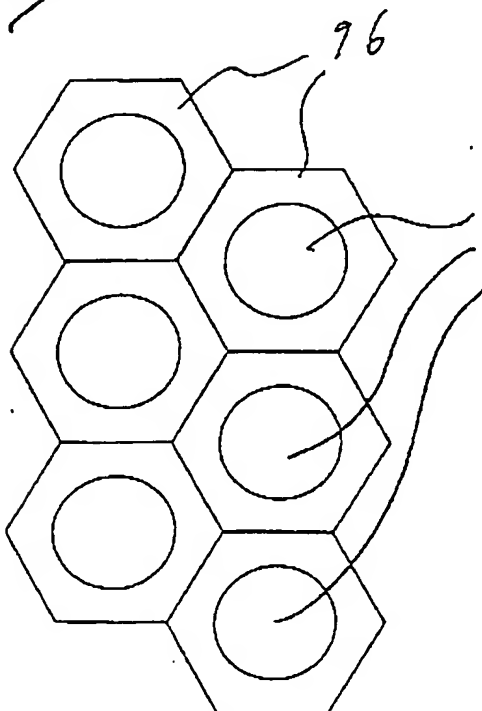


光ファイバ 95

~~FIG 68~~
~~FIG 68~~

~~FIG 68~~

FIG 68



95

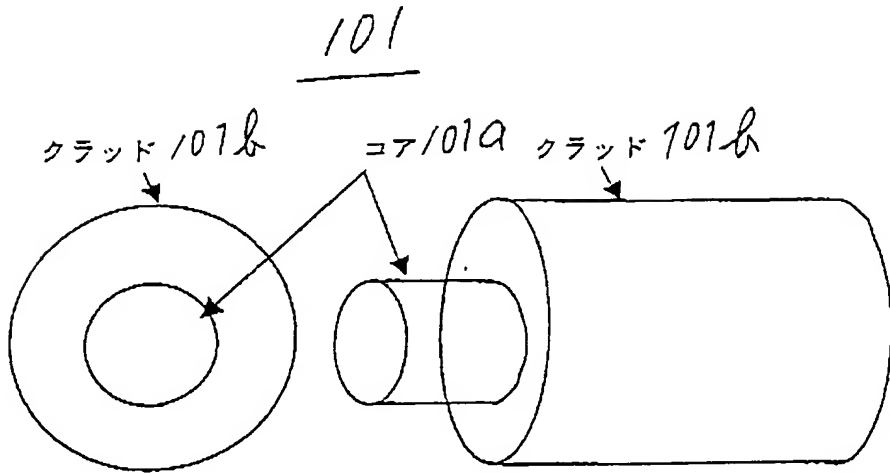
~~FIG 68~~
~~FIG 68~~

10085204.022602

第11

67
 [12/82]

FIG 69



70
 [12/83]

FIG 70

図52

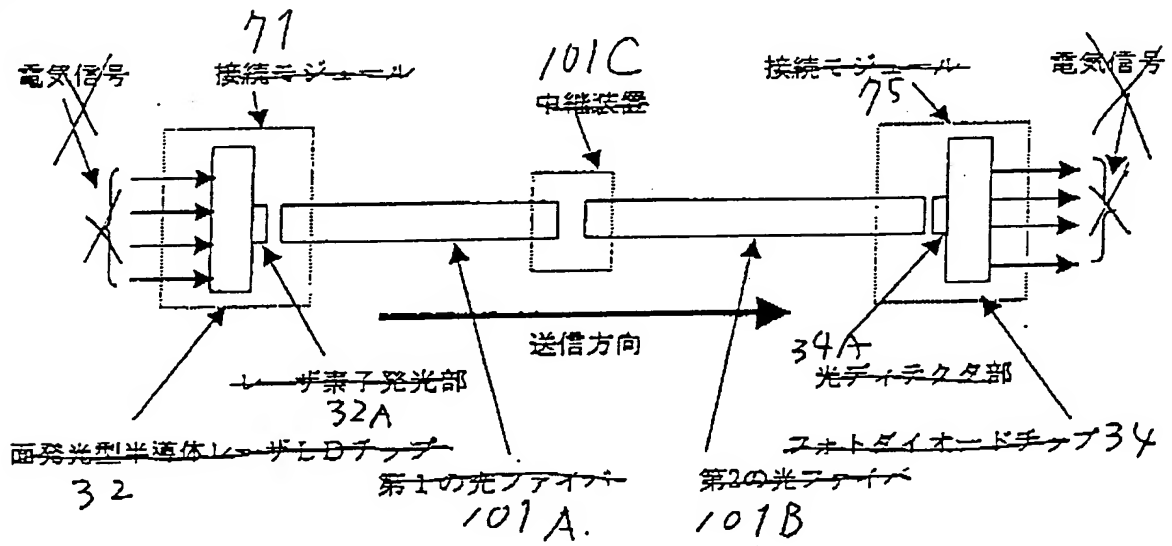


図53

10085204, 022602

FIG 71

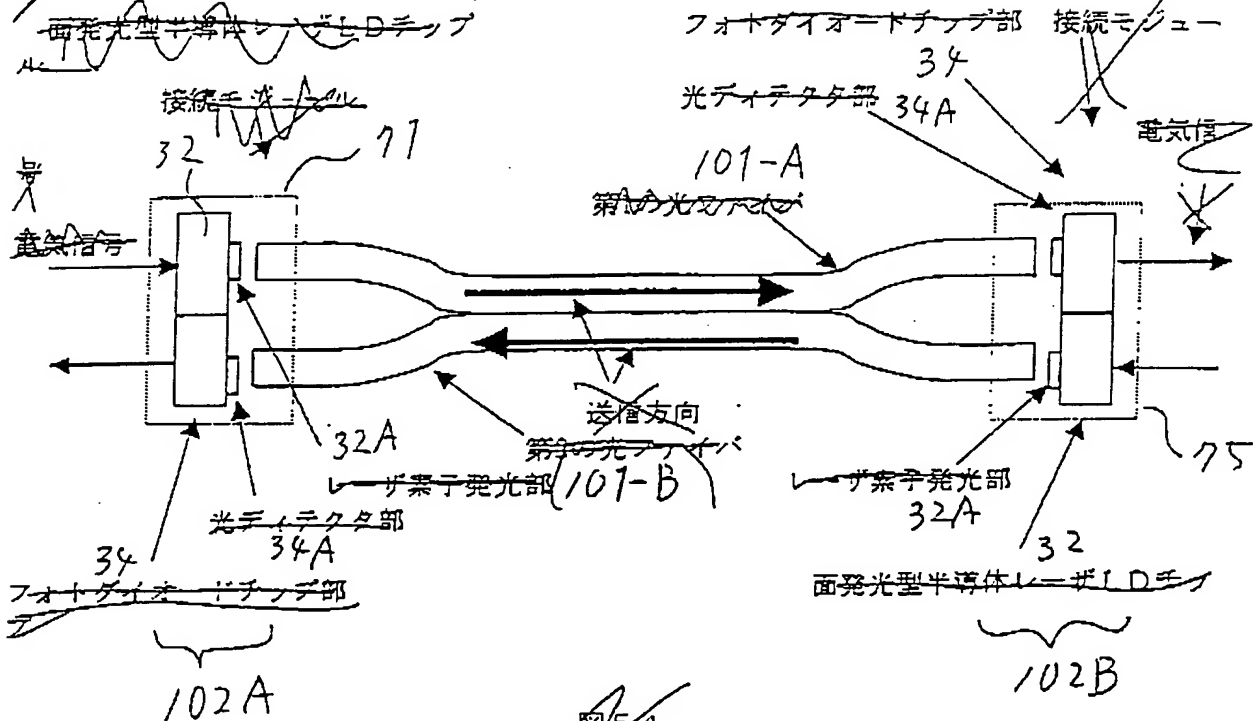


図54

FIG 72

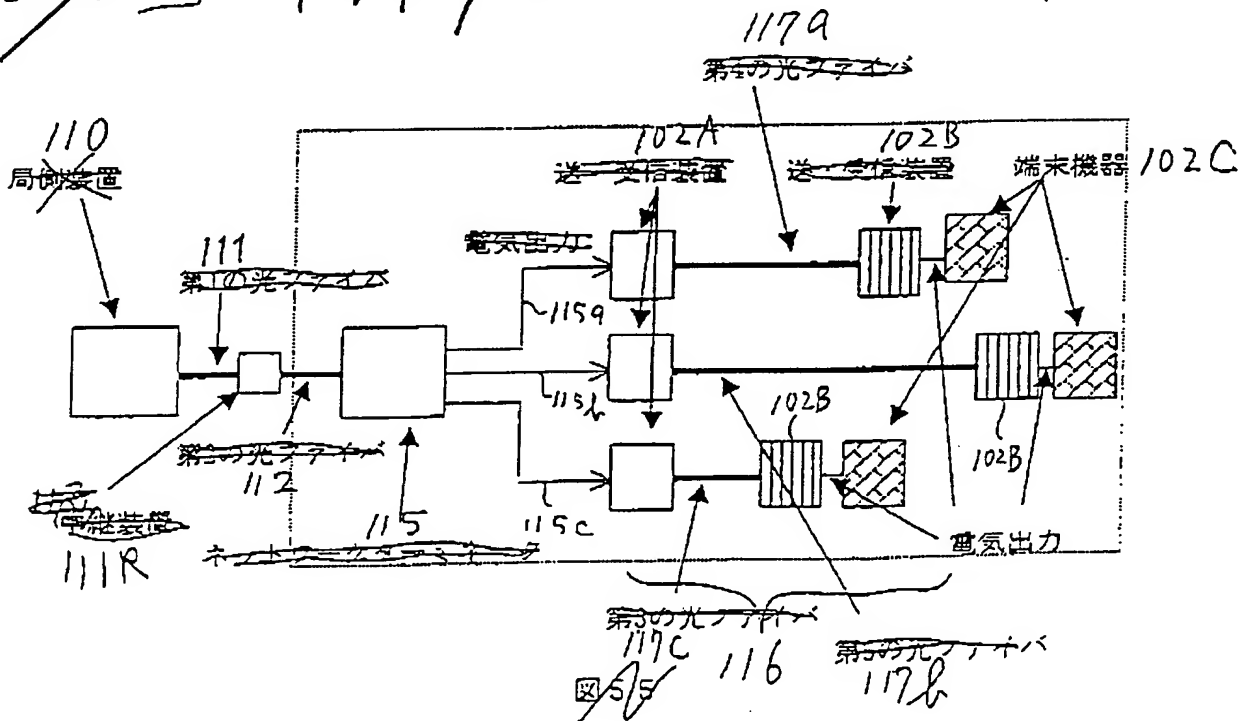
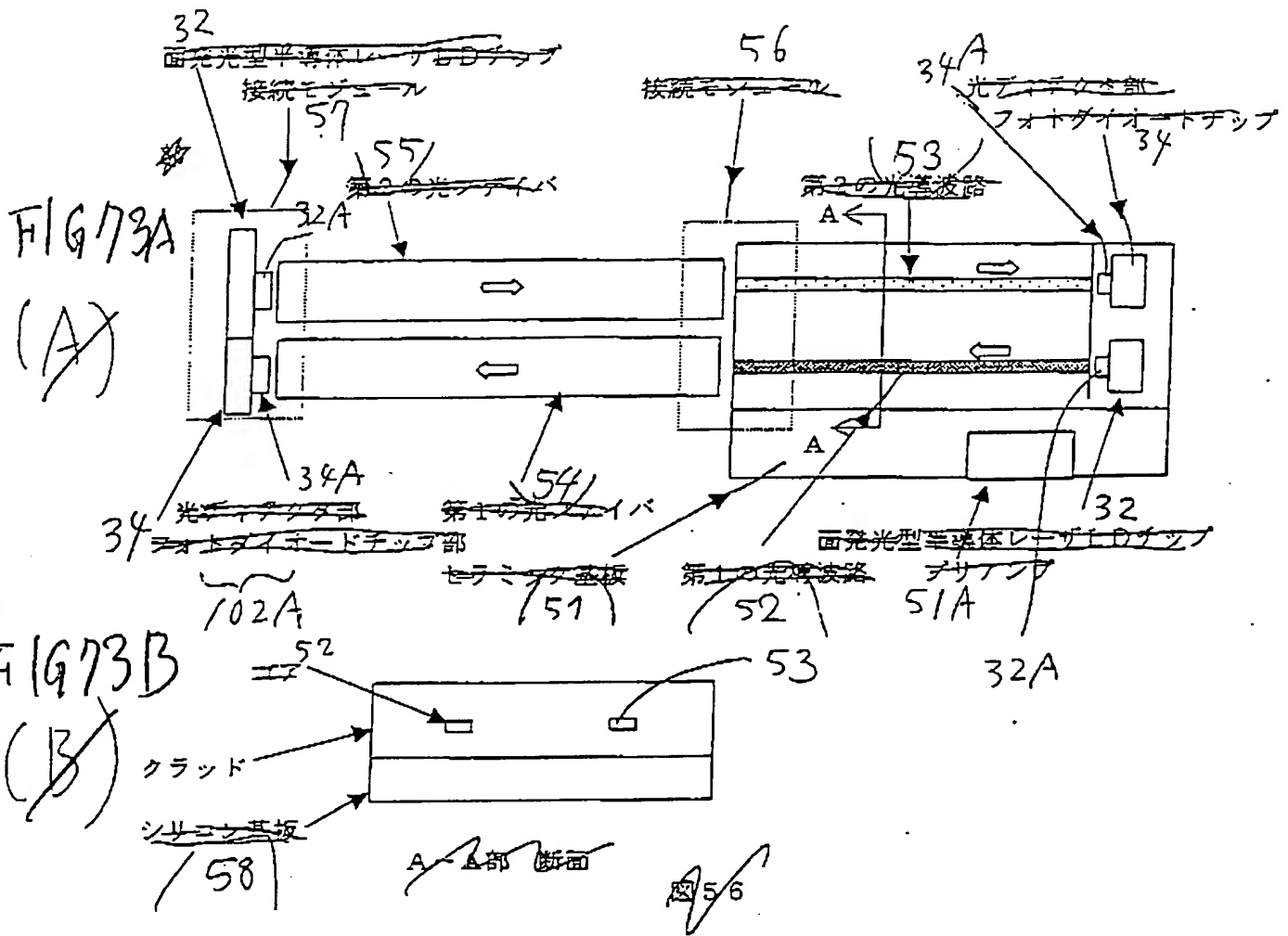


図55

10085204-022602

9/11

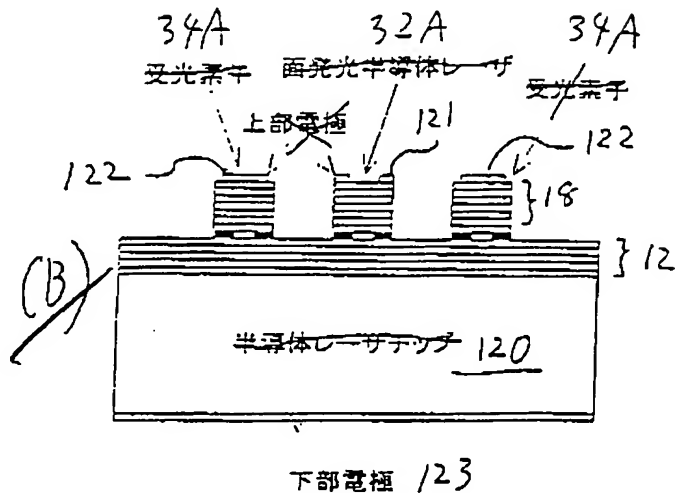
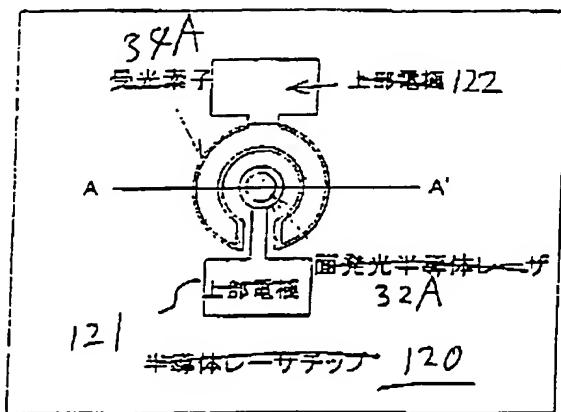
12/8/87



10085204.022602

~~FIG 74A~~ ~~FIG 74A~~

FIG 74B 12

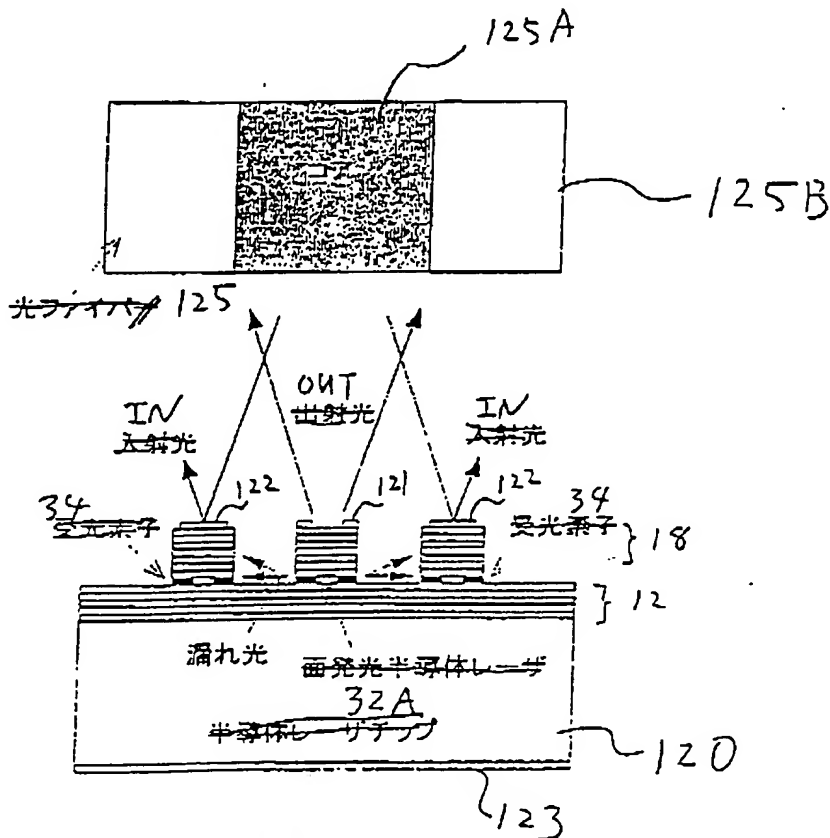


(A)

(B)

~~FIG 75~~ ~~FIG 75~~

~~FIG 75~~ ~~FIG 75~~



~~FIG 75~~ ~~FIG 75~~

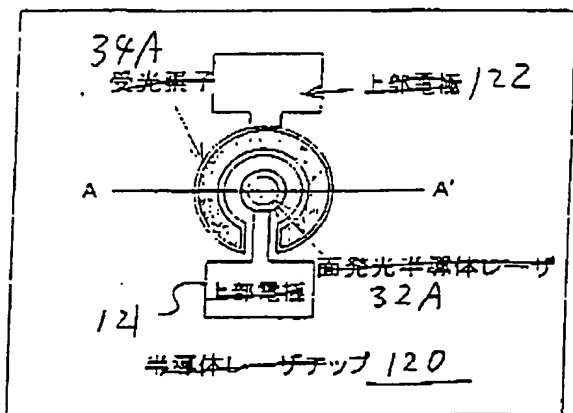
~~FIG 76A~~

FIG 76A

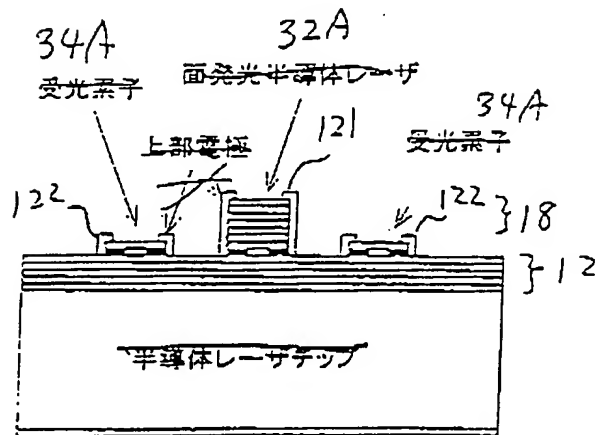
FIG 76B

FIG 12

~~(A)~~



~~(B)~~



下部電極 123

~~(a)~~

FIG 59

~~(b)~~

~~FIG 77~~

FIG 77

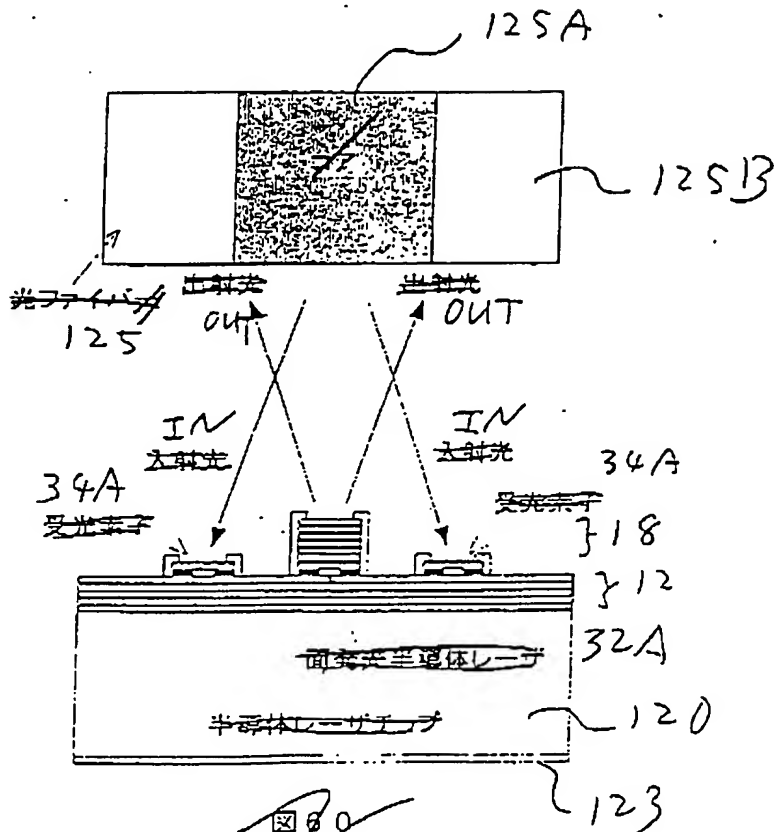


FIG 80

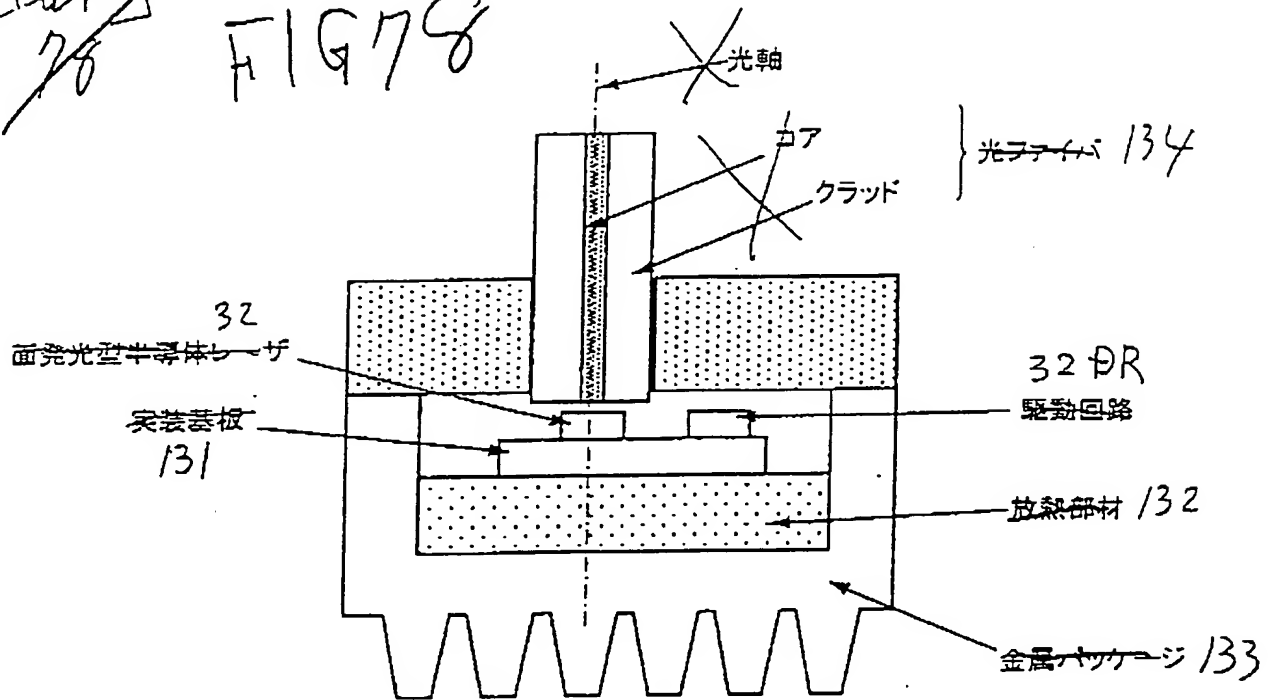
401

10085204, 022602

13

[18] 61
78

FIG 78



[18] 62
79

FIG 79

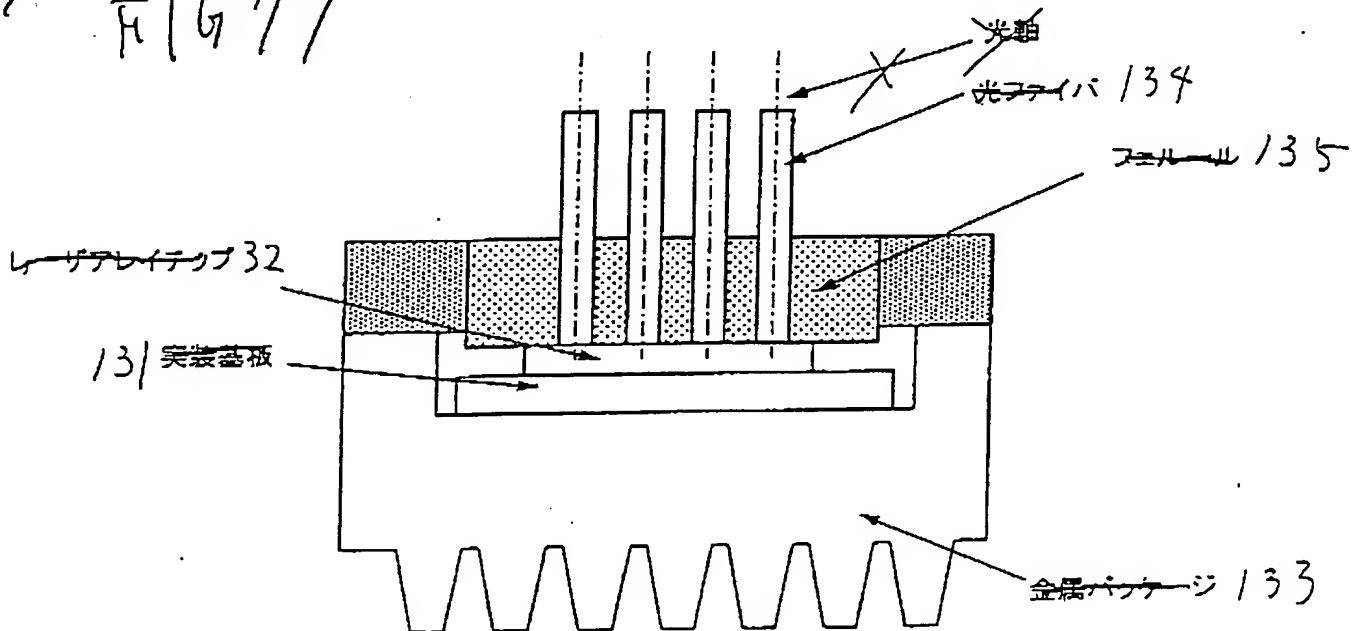


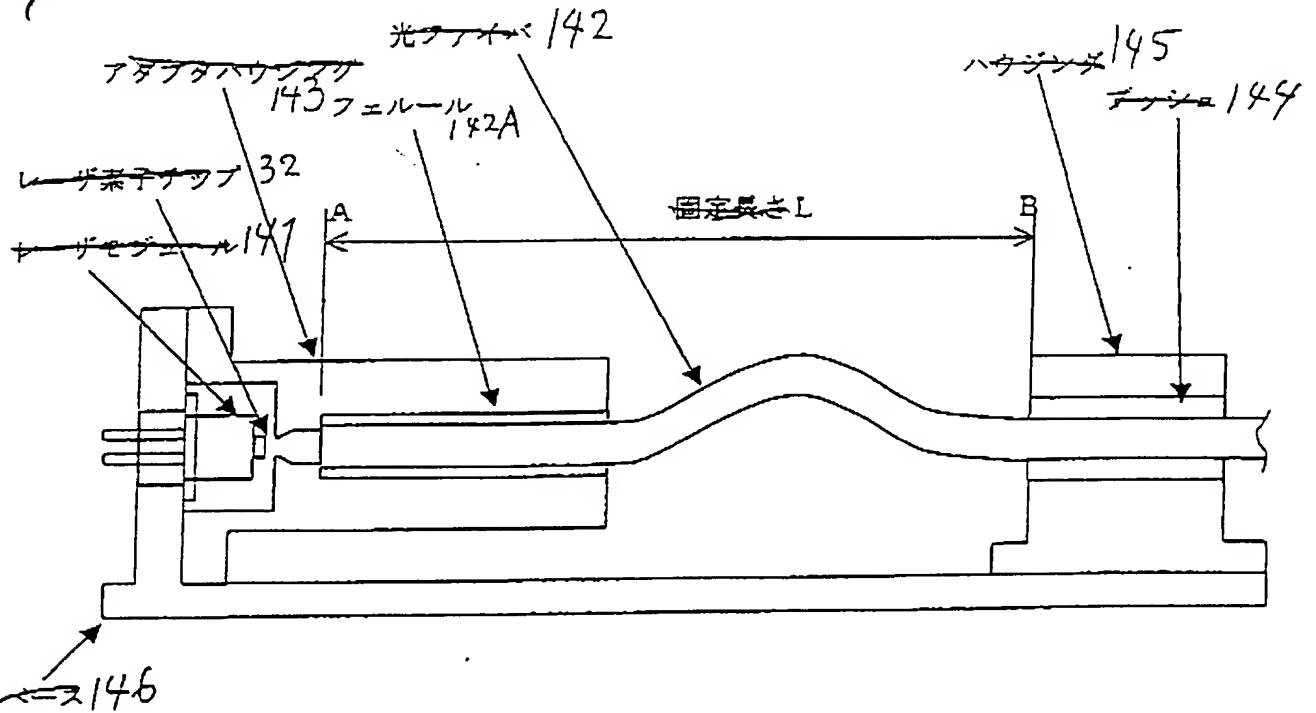
図 82

10085204, 022602

[図 63]
80

FIG 80

718



10055204.022602

[図 64]
81

FIG 81

図 63

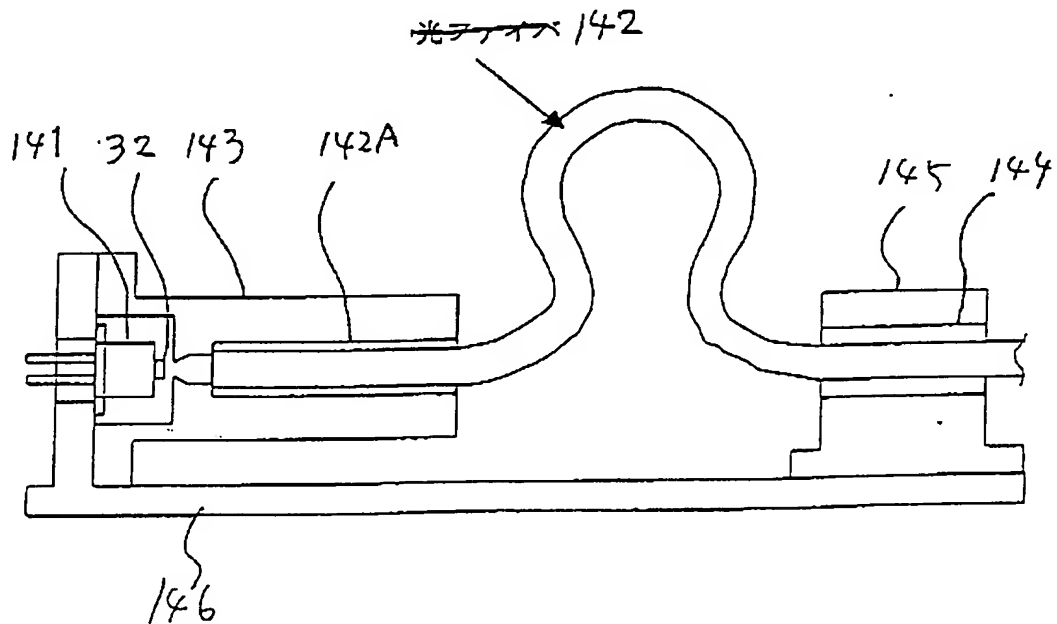
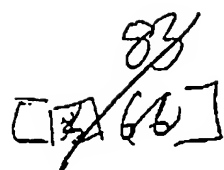
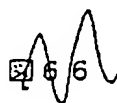


図 64

F | G 82



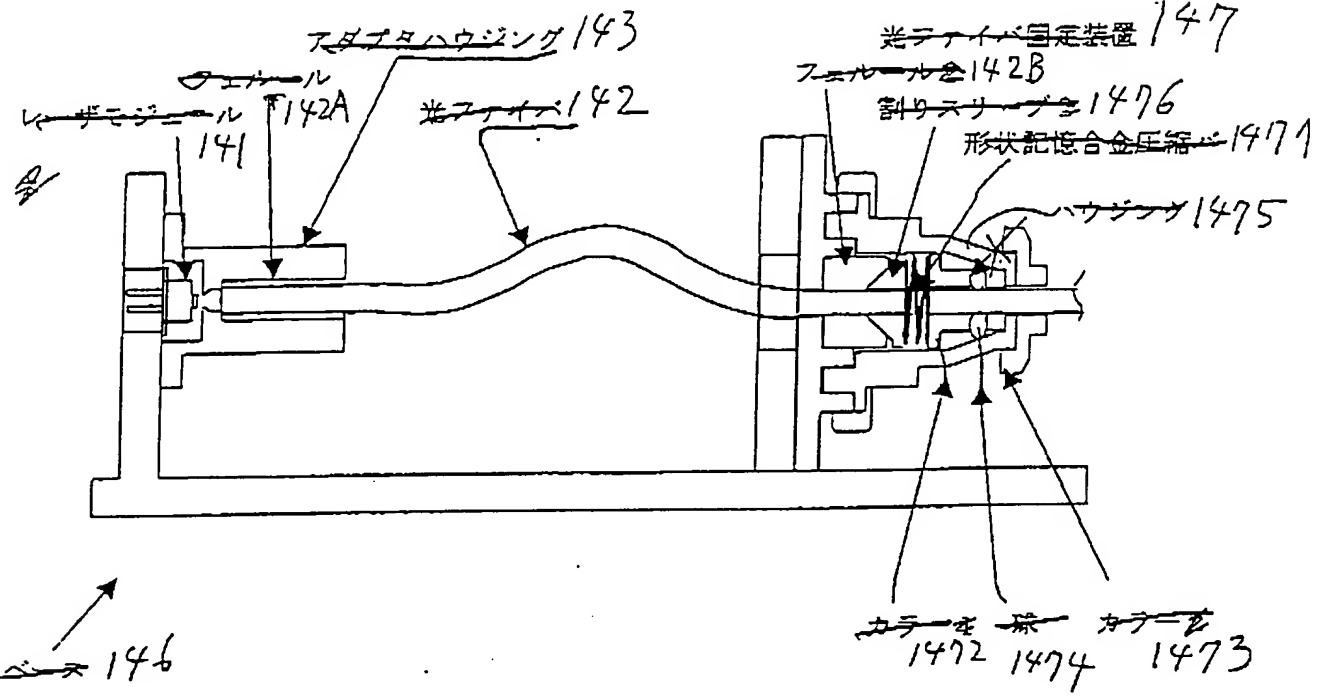
H/G 83



84
~~FIG 84~~

FIG 84

814



85
~~FIG 85~~

FIG 85

FIG 61

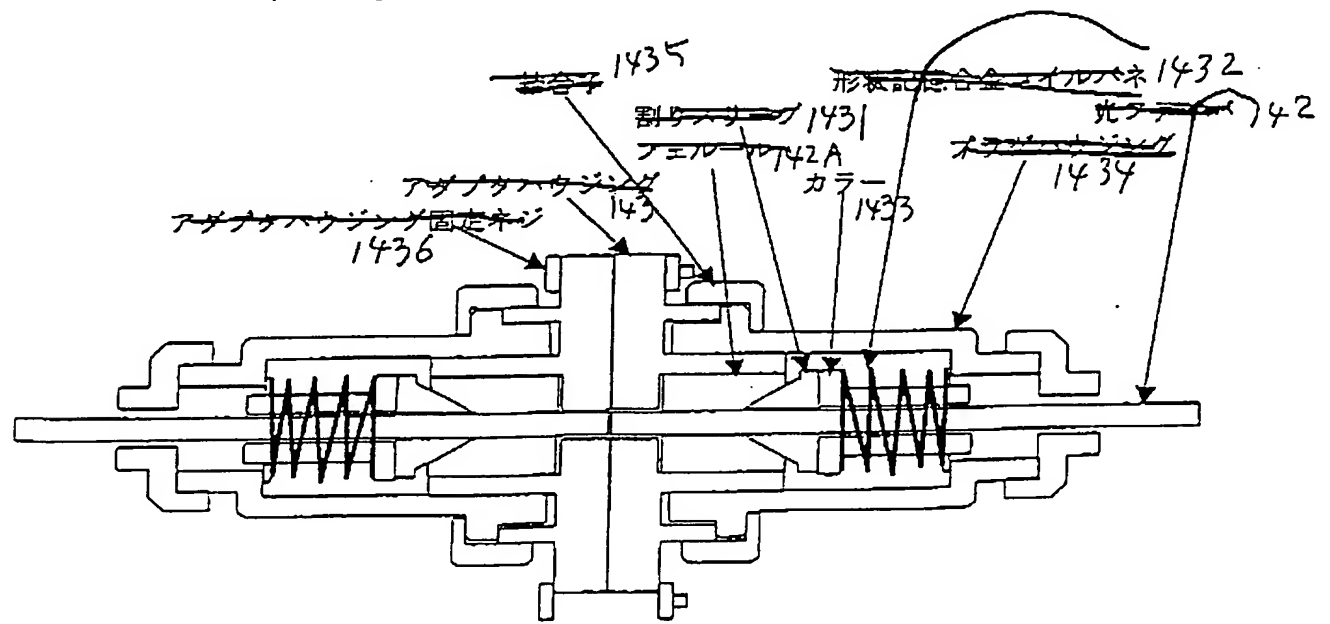
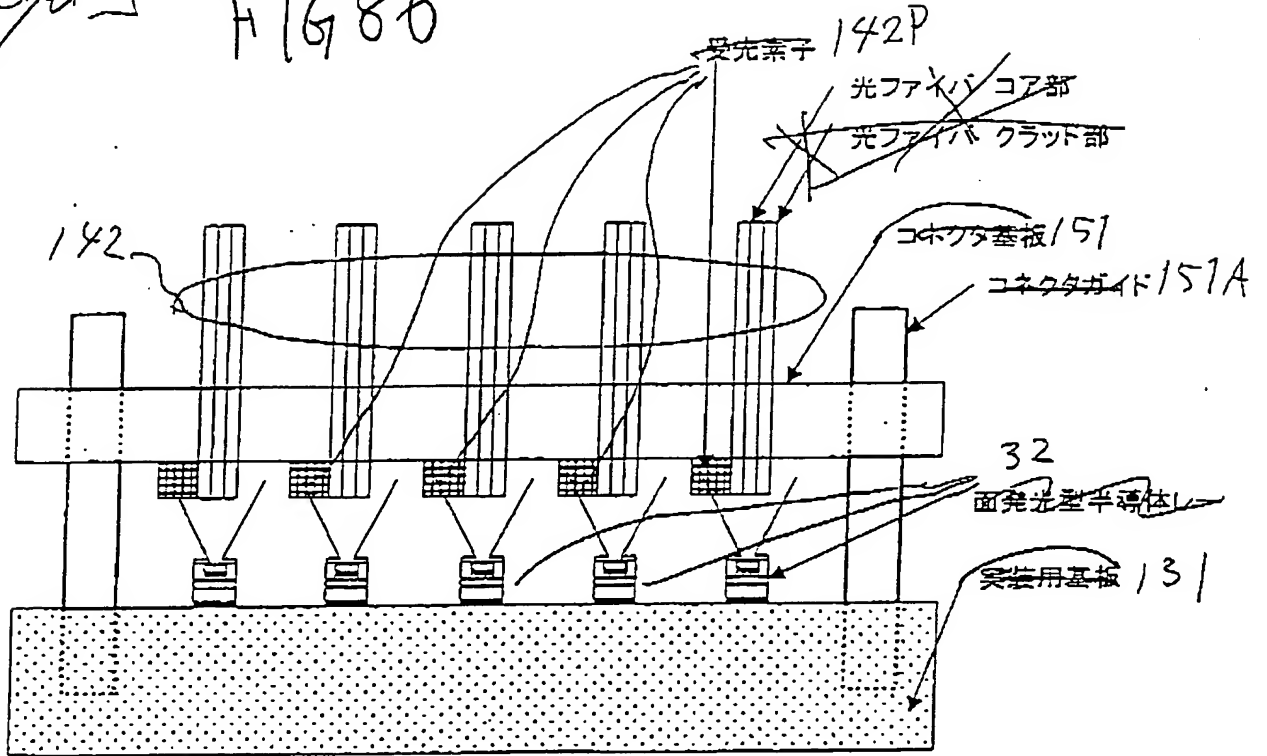


FIG 63

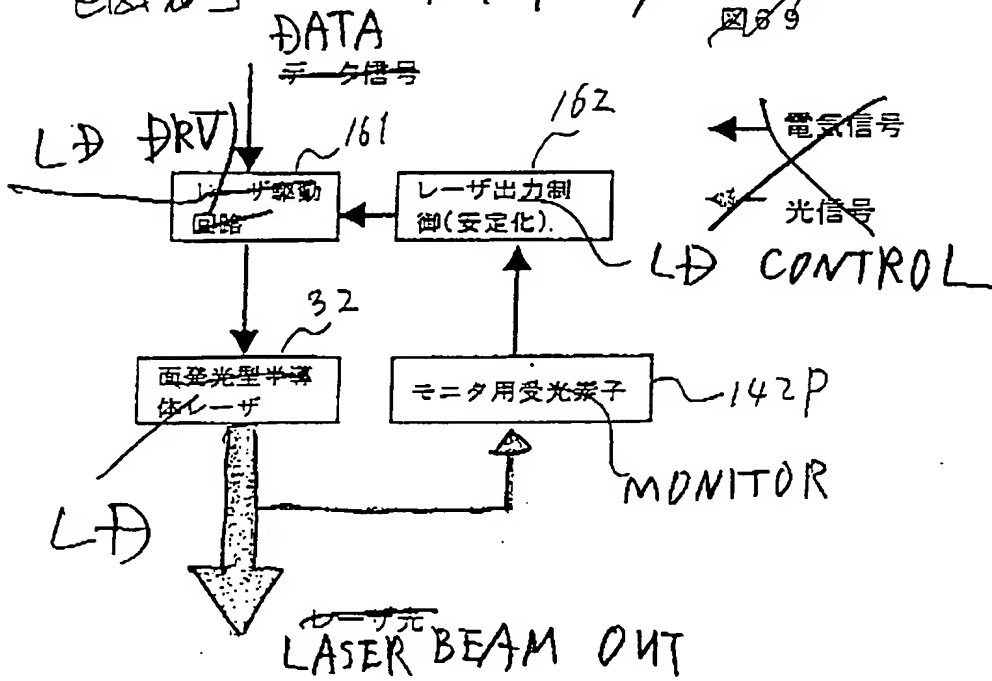
10085204, 022602

4/15

86
[図86] F/G 86



87
[図87] F/G 87



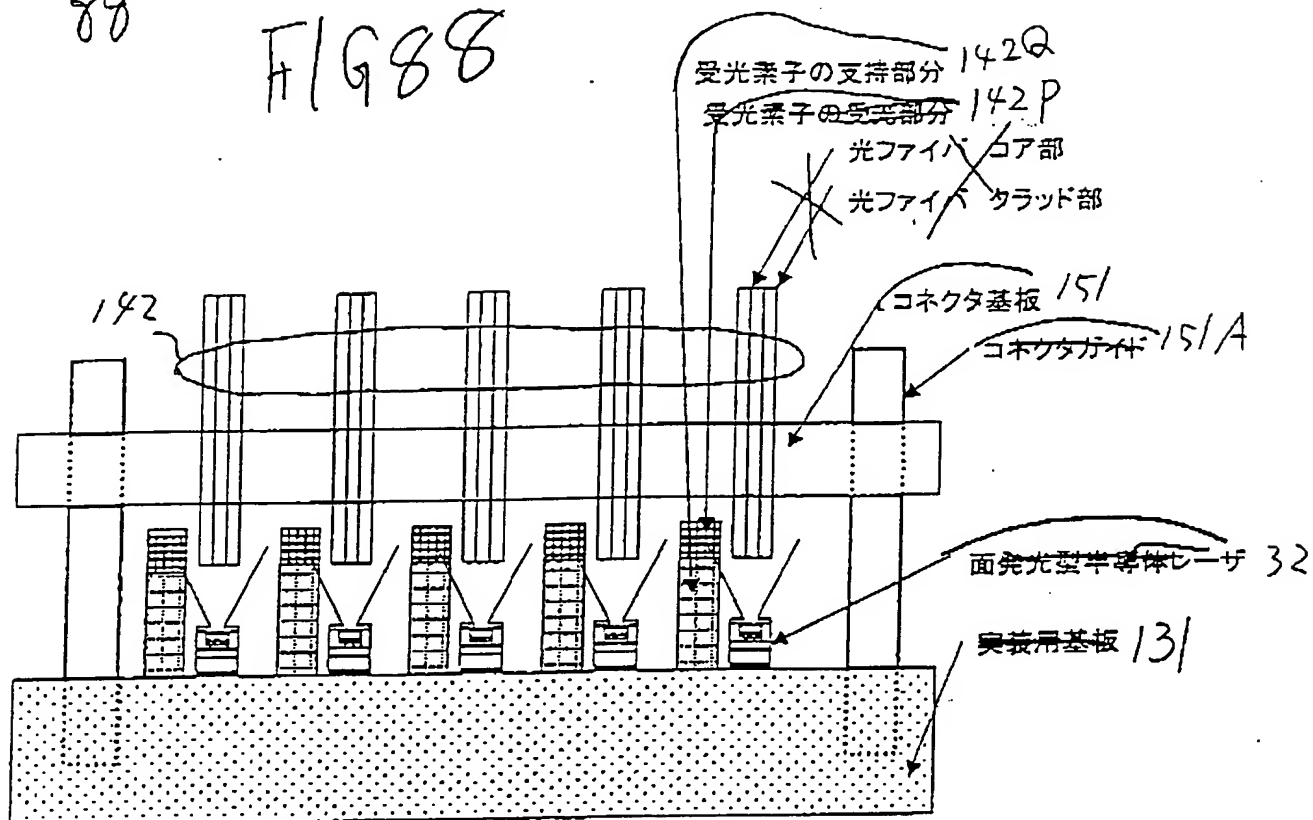
光出力部のブロックダイアグラム

図87

10085204.022602

□~~2~~21□
88

FI 988

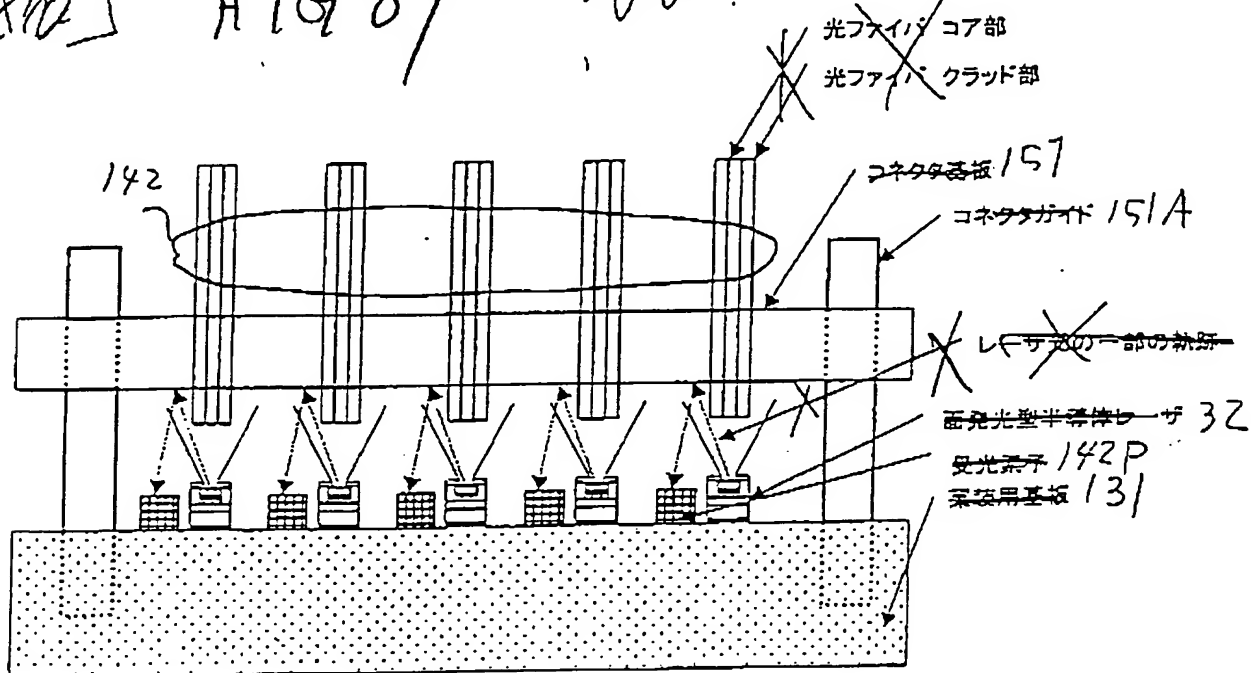


1005204 025607

 ~~$\begin{bmatrix} 1 & 2 & 3 \\ 2 & 3 & 4 \\ 3 & 4 & 5 \end{bmatrix}$~~

H/G 89

图 7-1



72

[13] 98
90

F/G90

15

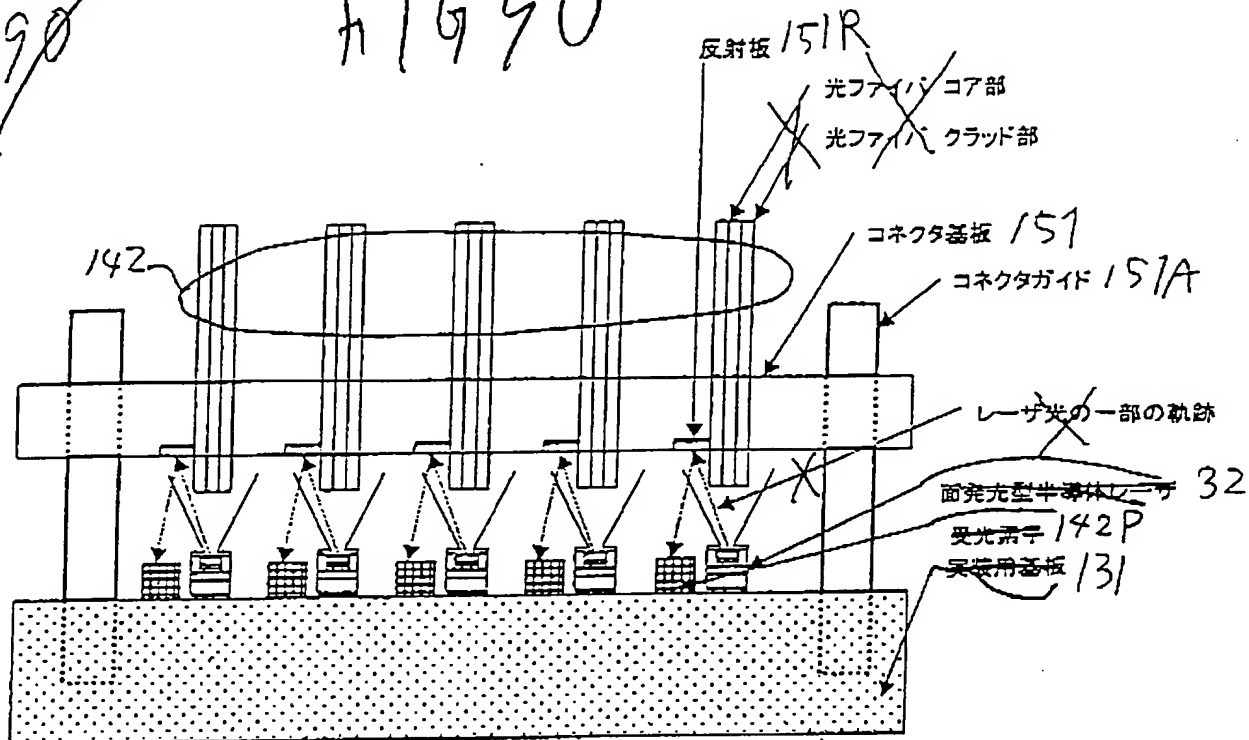


図 73

10055204.022602

16

FIG 91

FIG 91

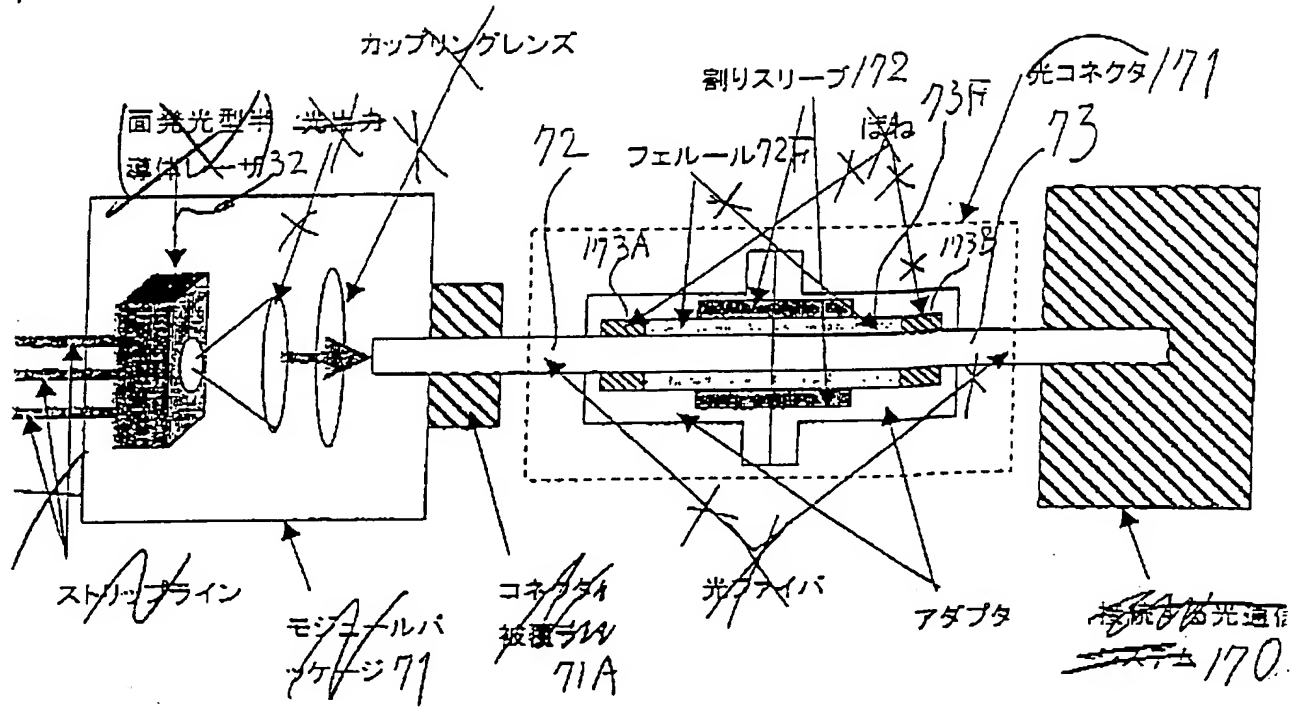


FIG 92

FIG 92

FIG 92

光ファイバ 72, 73

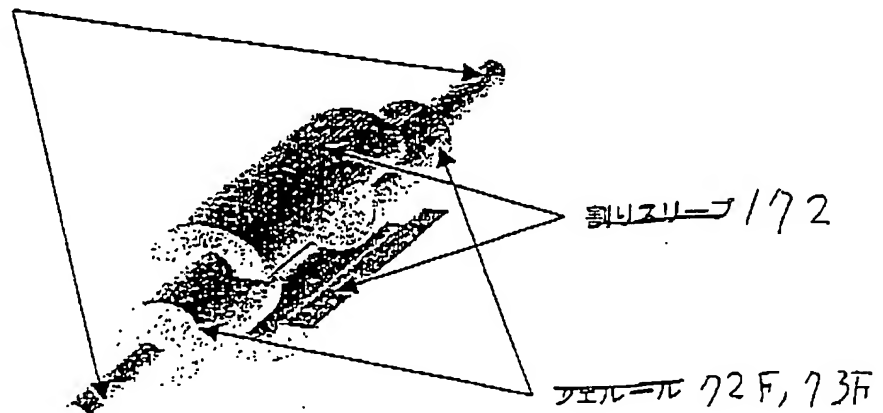
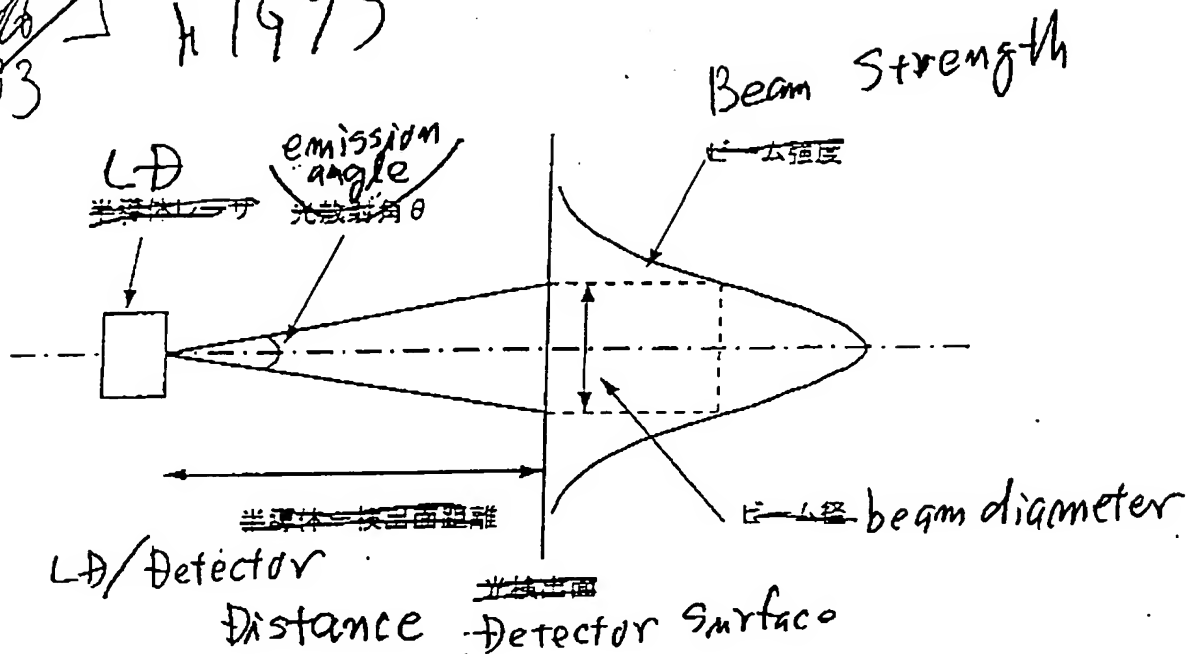


FIG 92

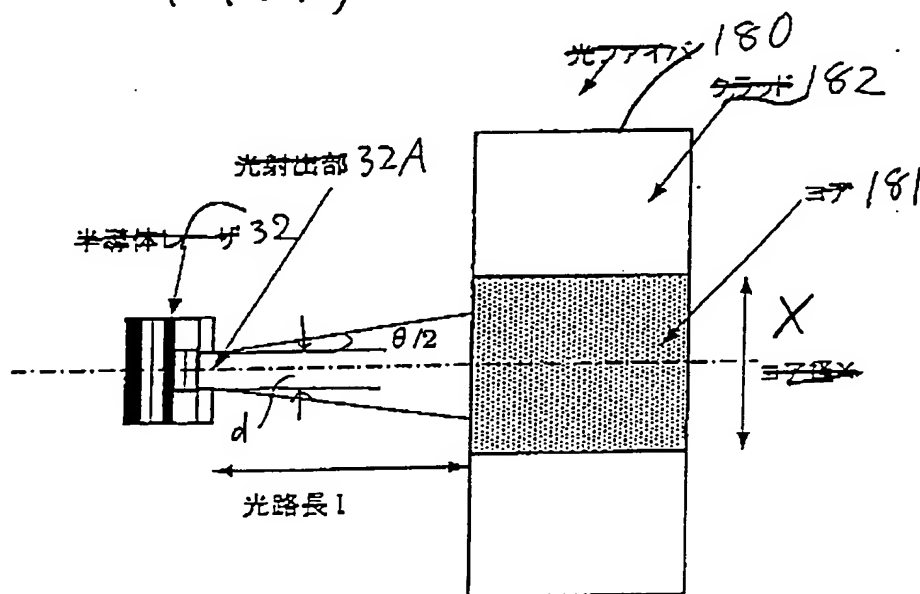
~~FIG 76~~ F1993

17



~~FIG 77~~ F1994

16



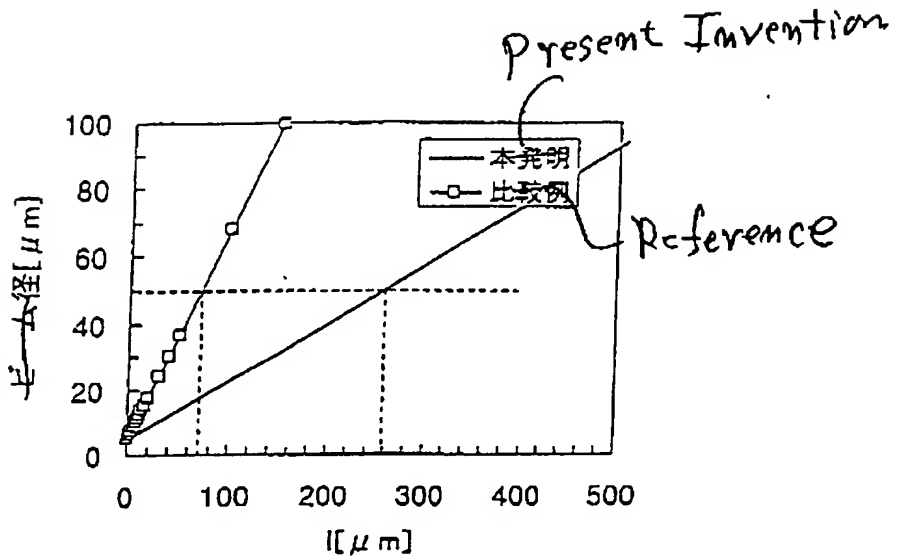
17

10085204.022602

[~~FIG 95~~]
95

FIG 95

Beam Diameter



[~~FIG 96~~]
96

FIG 96

図 78

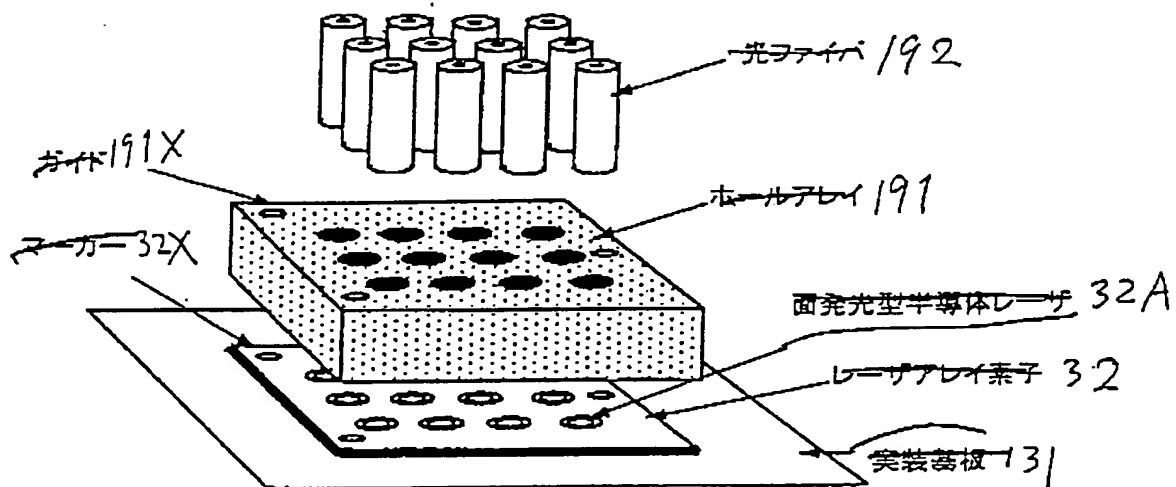


図 78

10085204.022602

~~[80]~~
97

19

FIG 97A

(A)

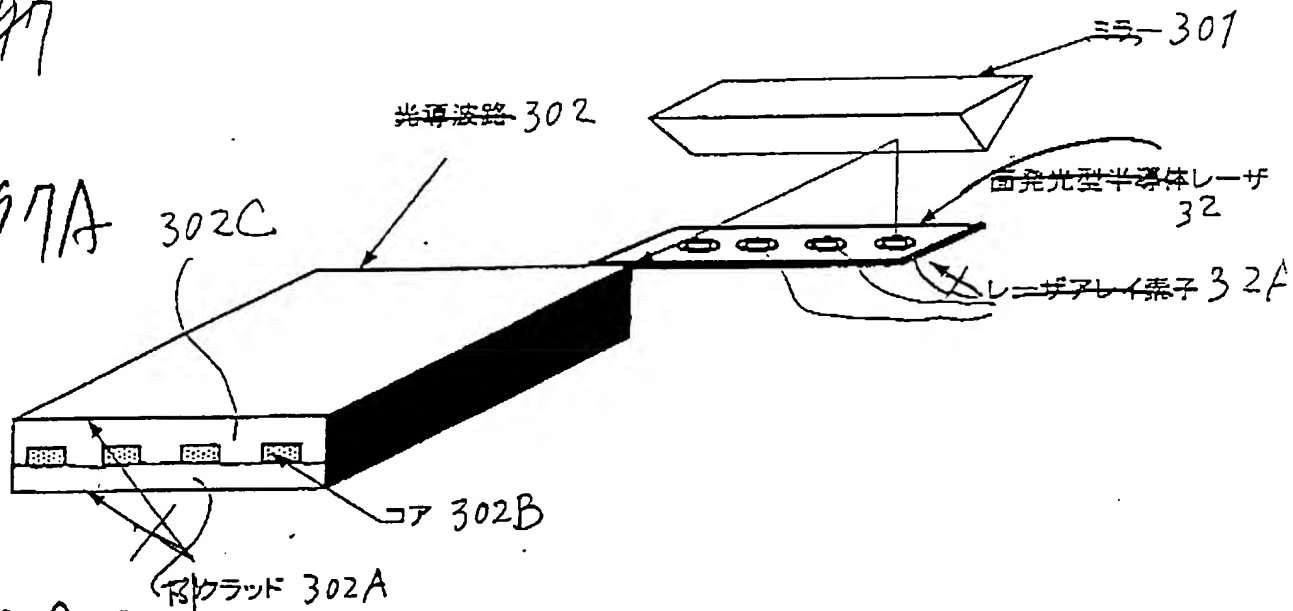
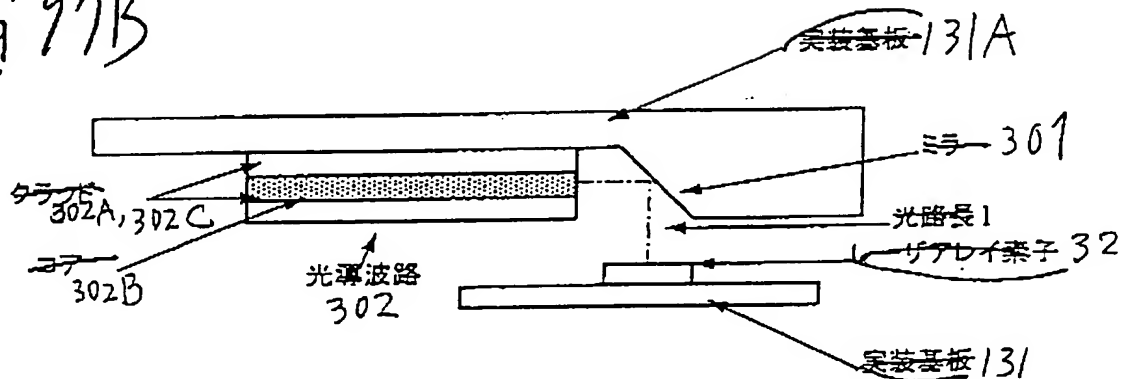


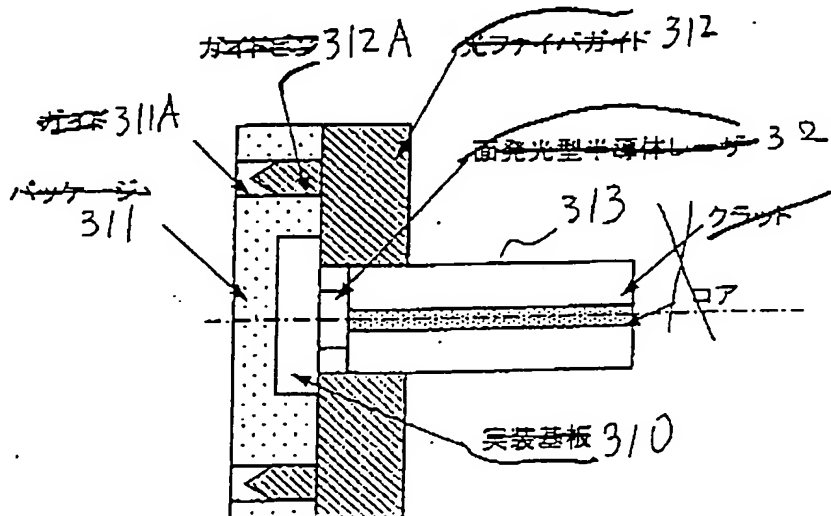
FIG 97B

(B)



~~[81]~~
98

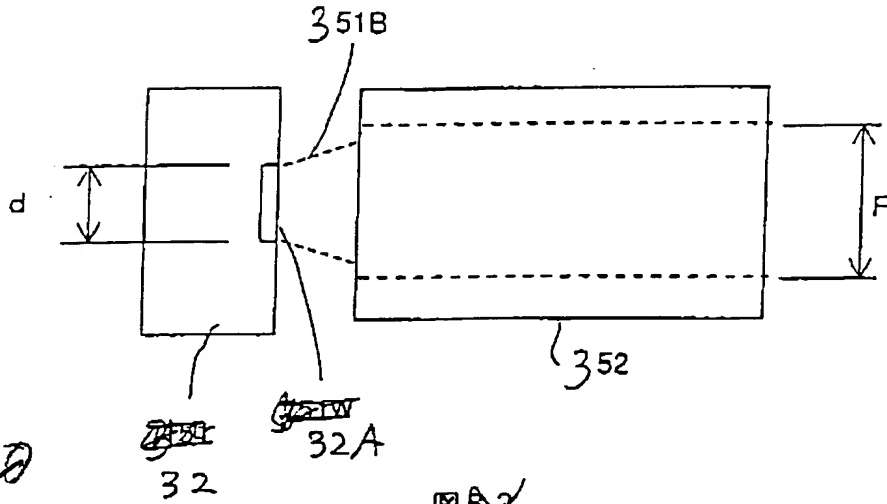
FIG 98



9/21

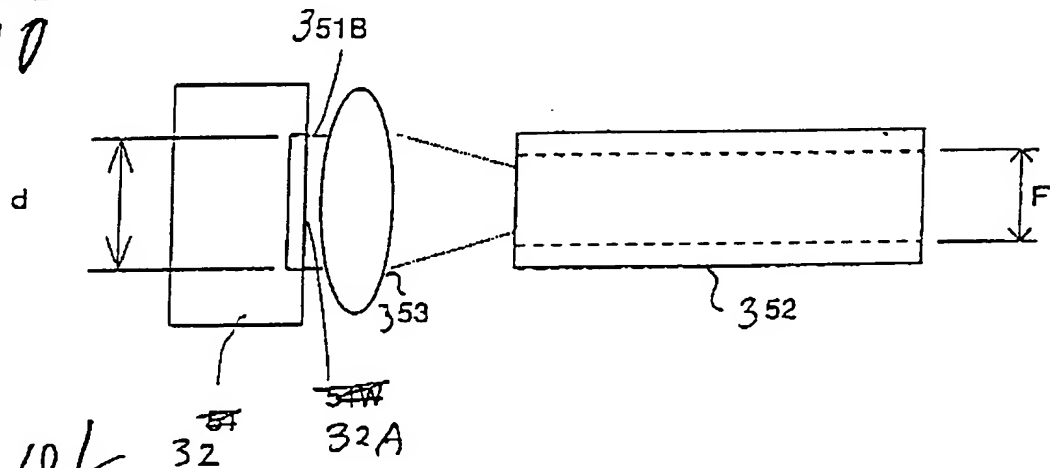
77
~~FIG 99~~

FIG 99



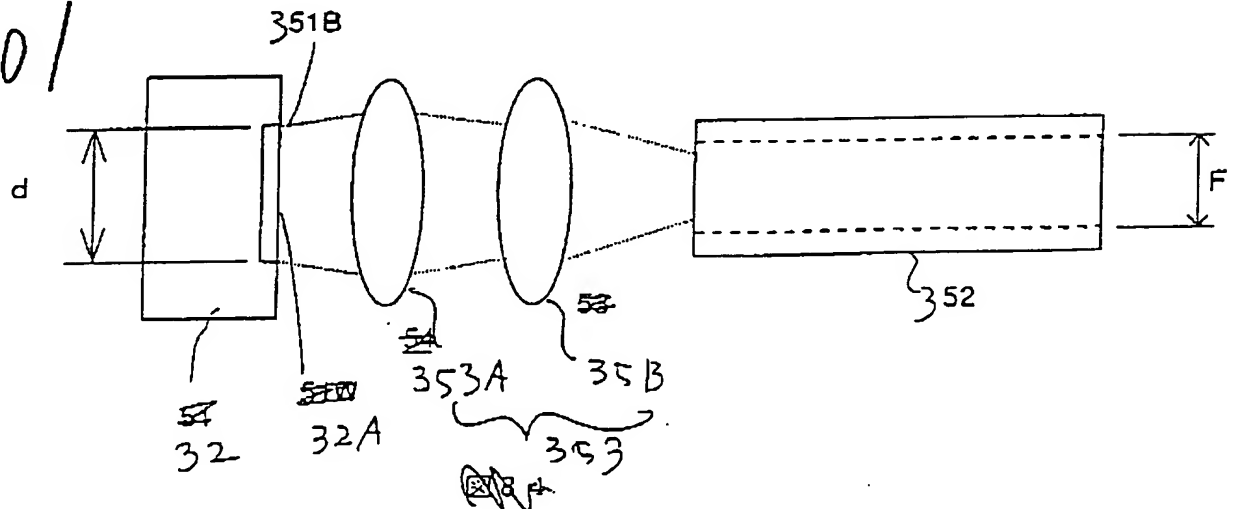
100
~~FIG 100~~

FIG 100



101
~~FIG 101~~

FIG 101

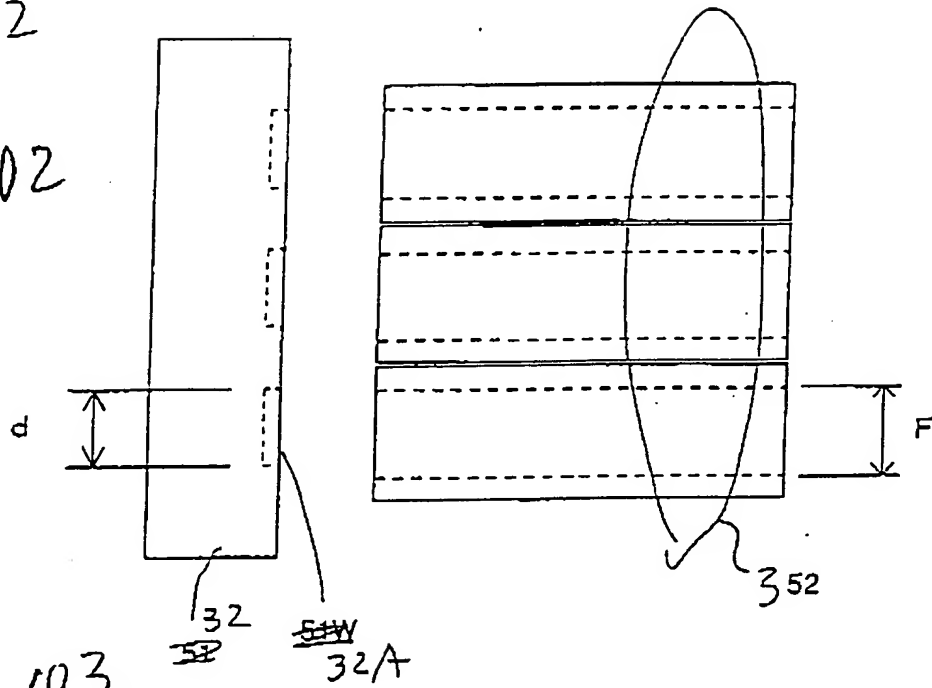


10085204.022602

[13 888]
102

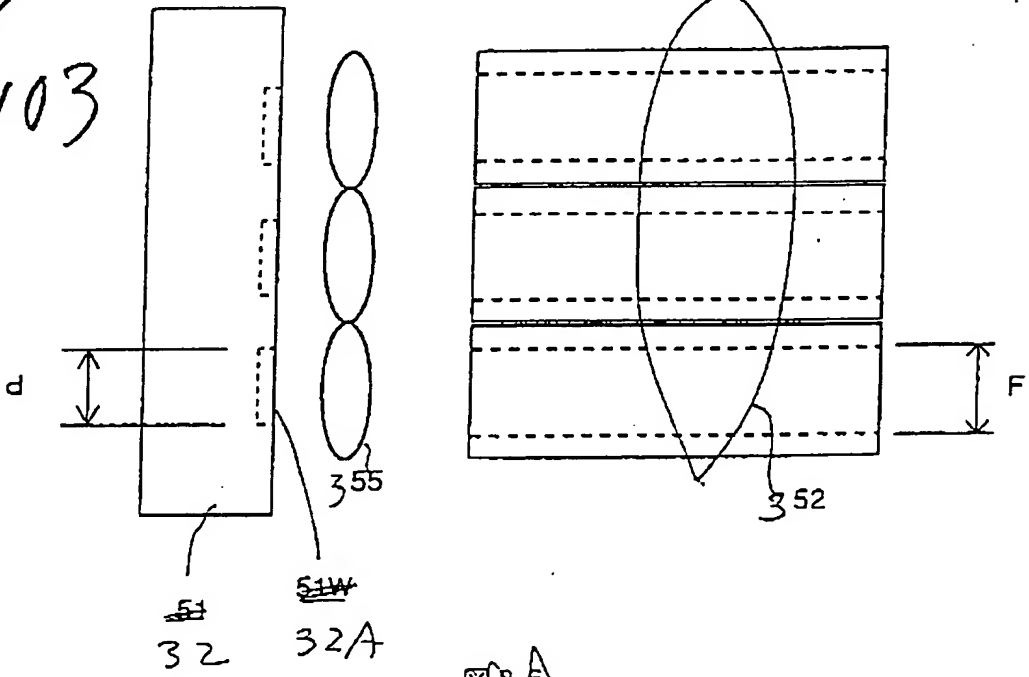
712/

F/G102



103
[13 888]

F/G103



8/5

8/5

10085204.022602

第22

[図87]
104
FIG104A
(A)

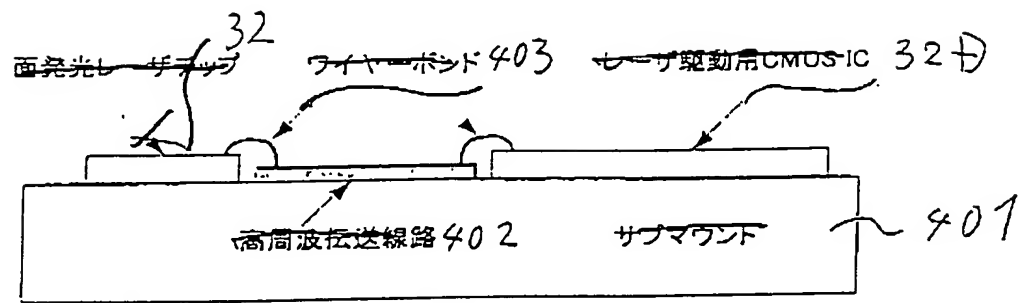
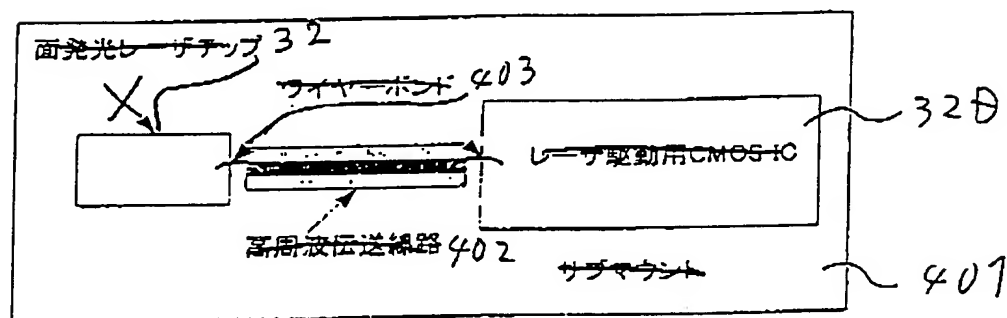


FIG104B
(B)



105
[図88]

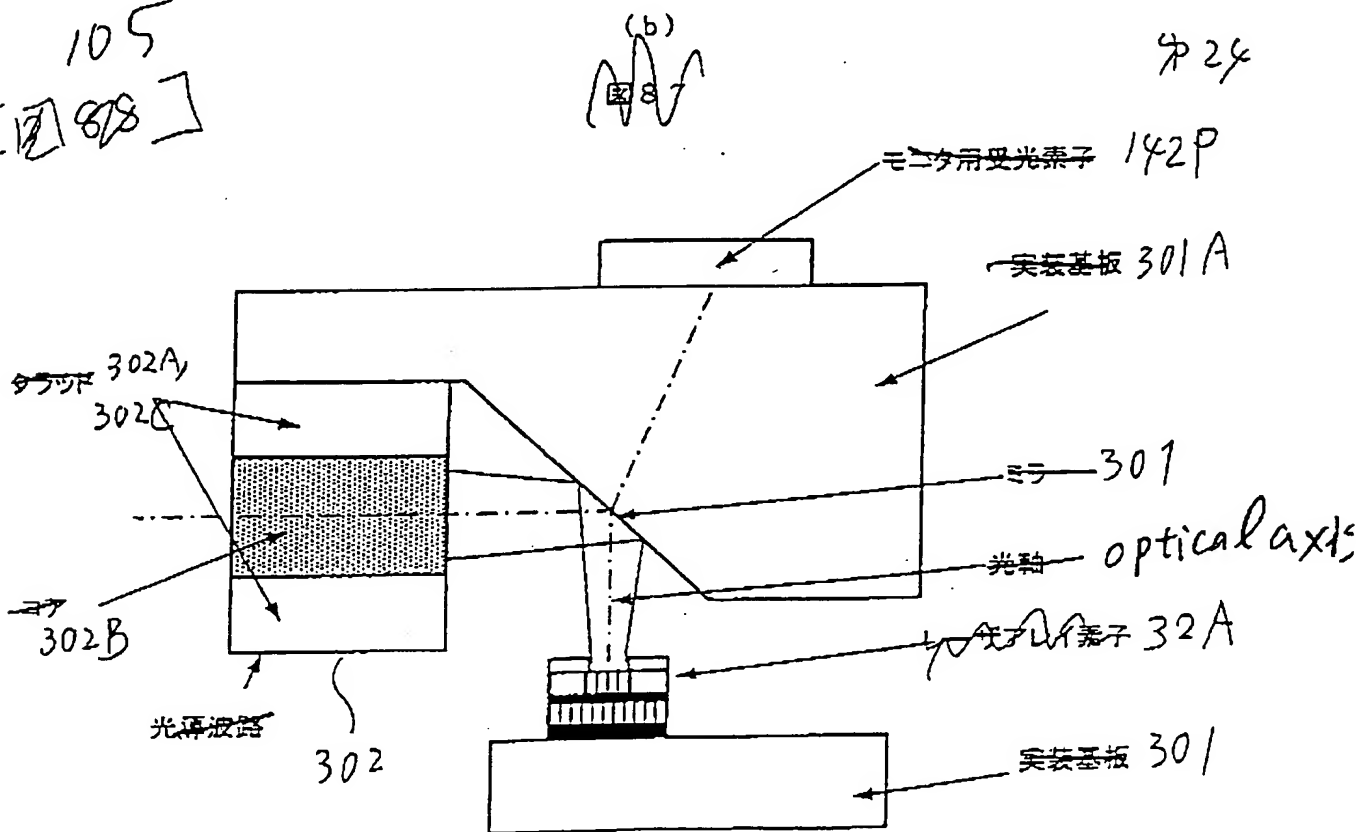


図8-8

10085204, 022602

724

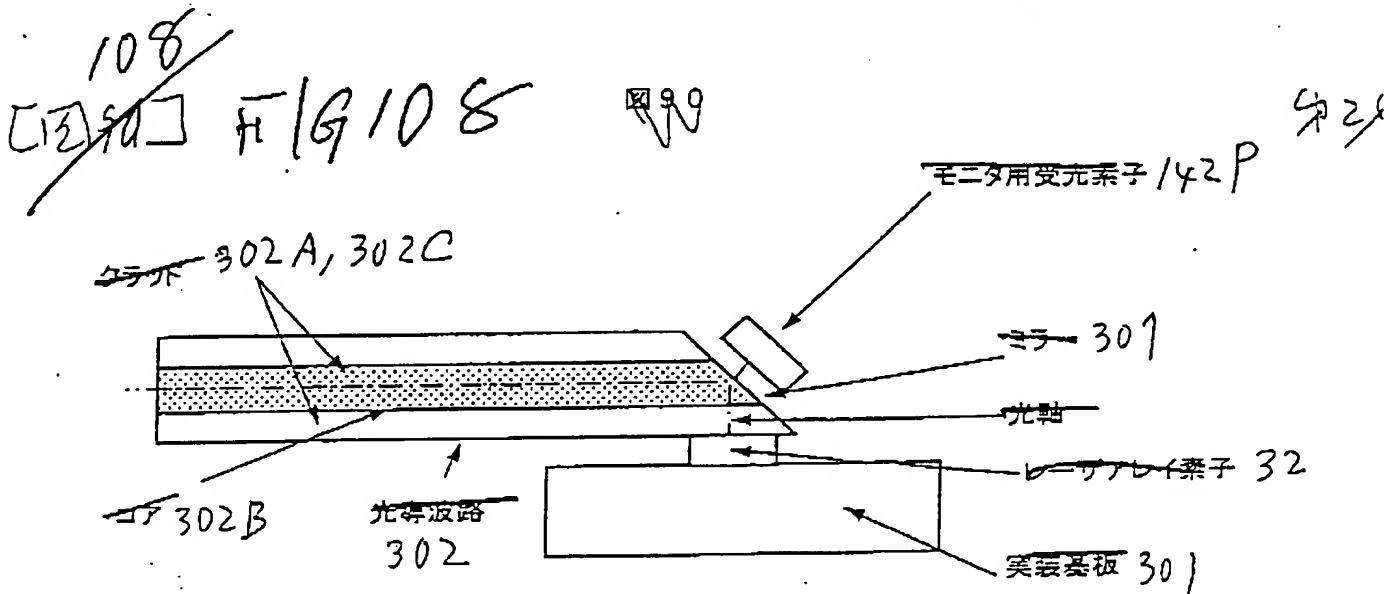
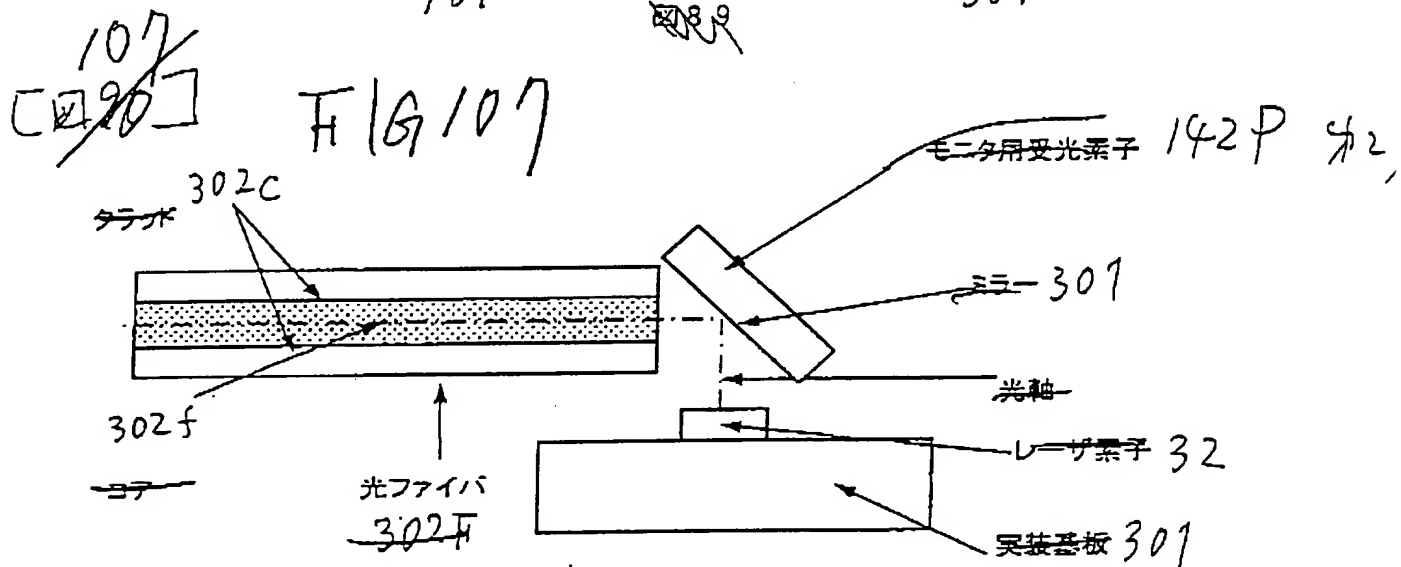
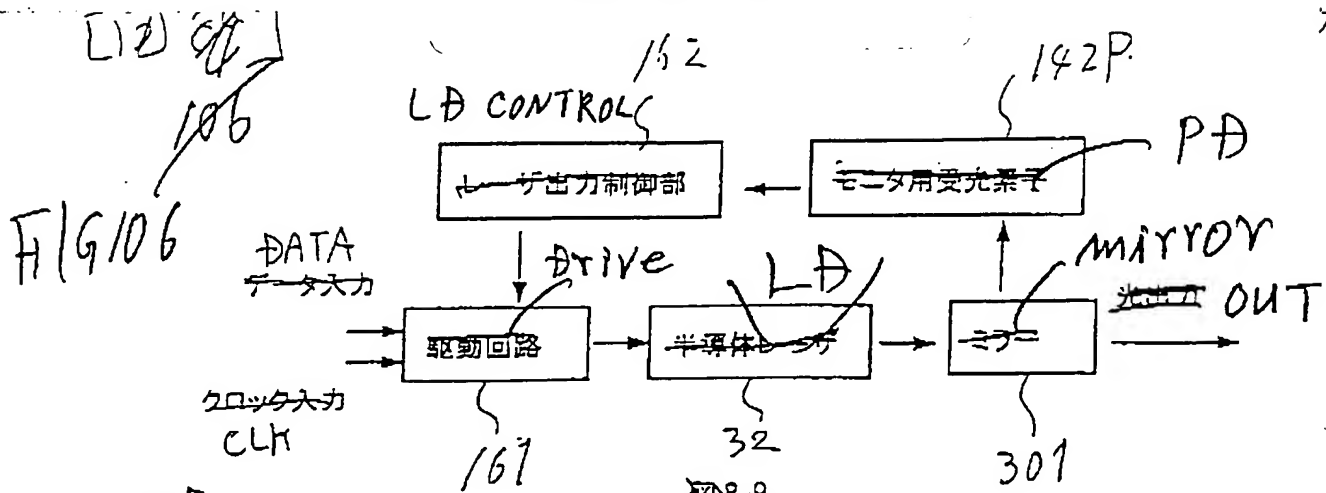


FIG 109

10085204, 022602

425

~~[12 92]~~
 109
 FIG 109

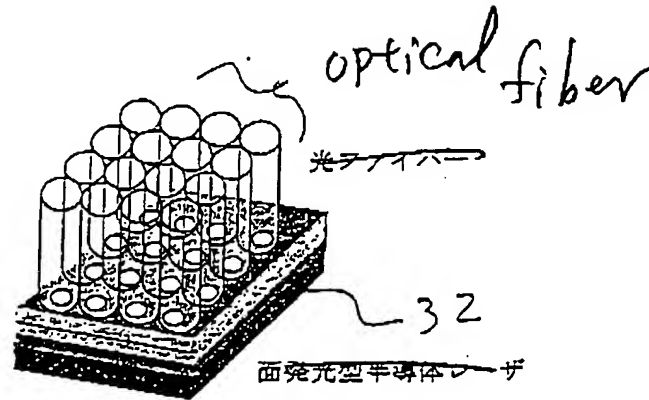
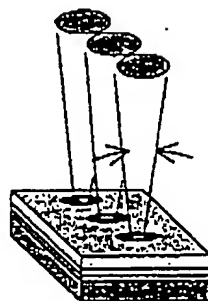
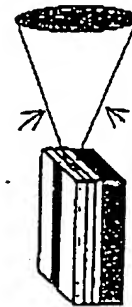


図 9-2

110
~~[12 96]~~
 FIG 110 A
 (A)



(B)



(a) 面発光型半導体 (b) 端面発光型半導体

図 9-3

10085204.022602

[E] 94
 111

FIG 111A

(A)

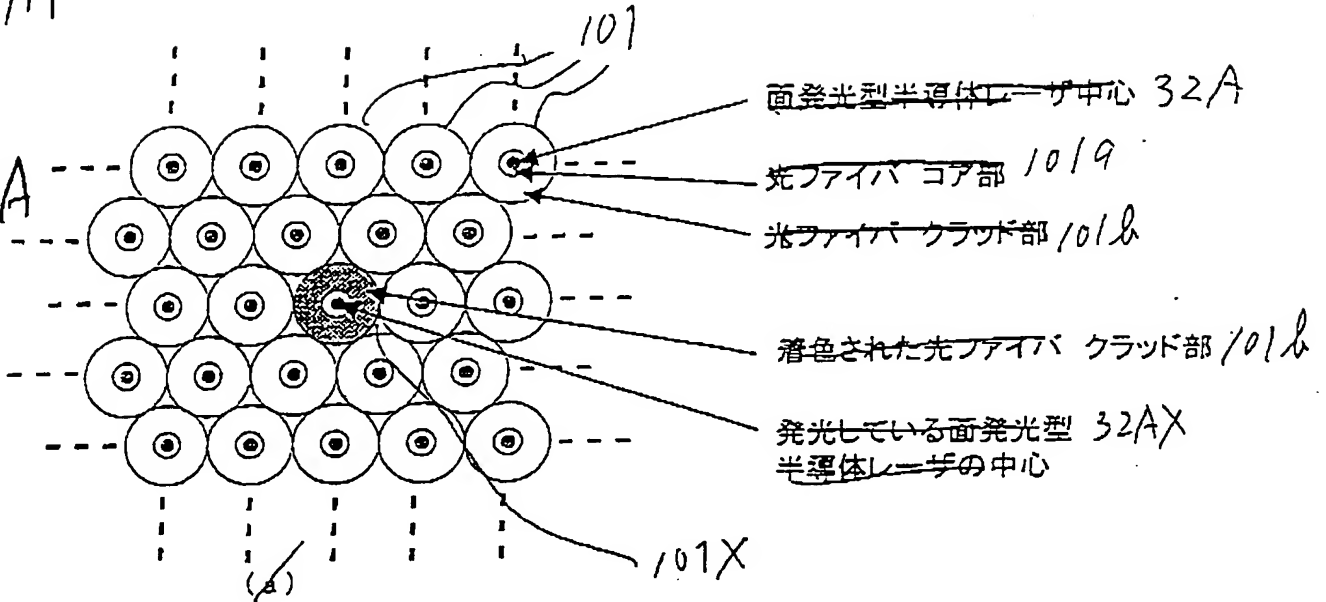


FIG 111B

(B)

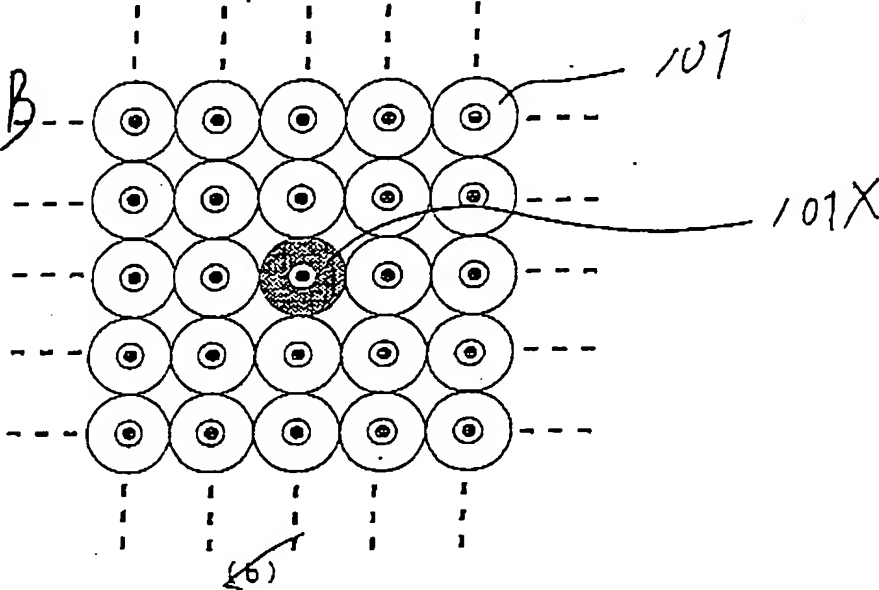


FIG 111C

(C)

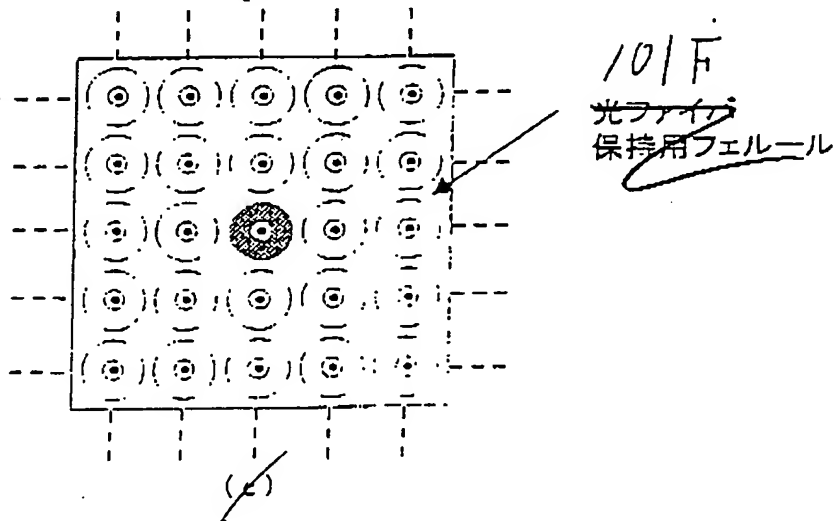
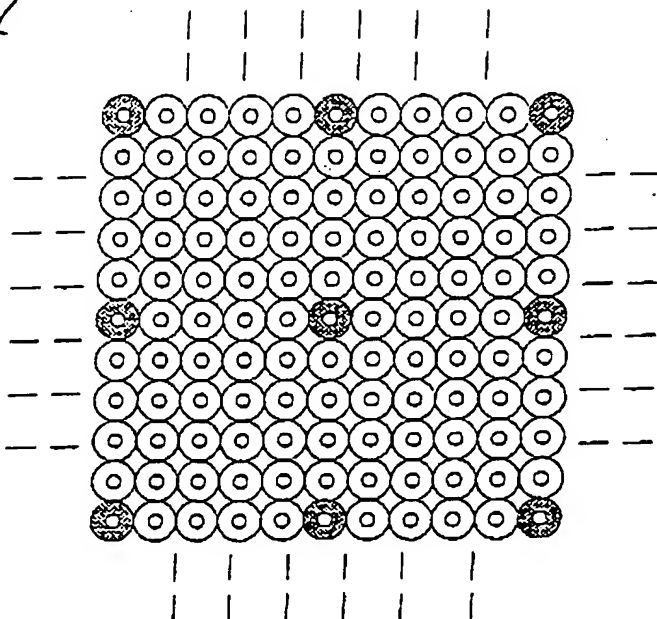


図 9 4

112
~~112~~
~~95~~

FIG 112

425



10085204.022602

113
~~113~~
~~96~~

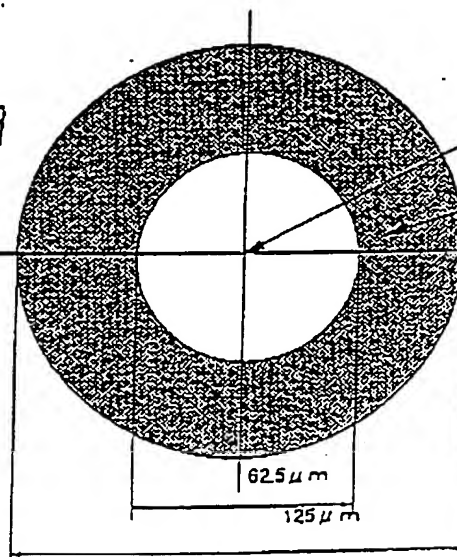
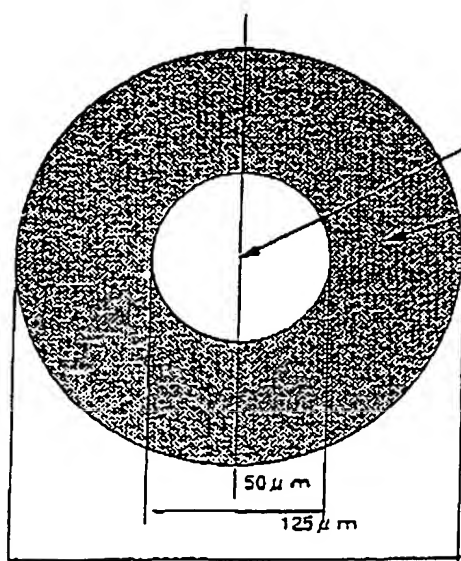
95

(A) FIG 113A

425

FIG 113B

(B)

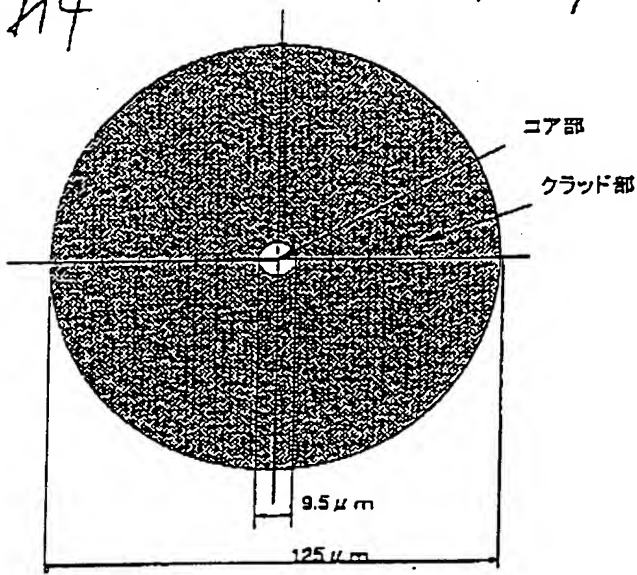


96

~~FIG 114~~
 114

FIG 114

25

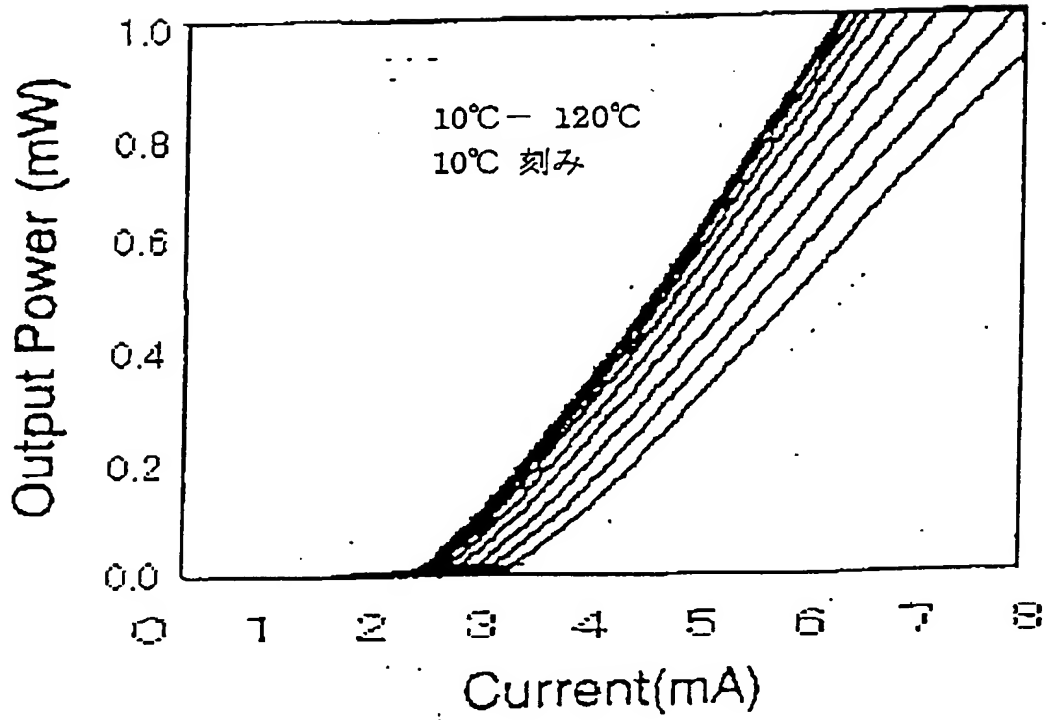


~~FIG 115~~
 115

~~FIG 115~~

FIG 115

26



~~FIG 115~~

209220-40258001

H 19116

光出力上限

光出力下限

Optical Lower Limit

Temperature 温度下限

温度下限

Upper Limit

上海 95 年 1 月 1 日

Temperature
Lower Limit

Current

電氣 a

—電流 b

Current

笔流 x

Chyrent

~~117~~ H1G117

图 9 合

COMMUNICATION
CONTROL

914

CONVERSION TABLE

通信制御部

~~光量 補正値~~
~~変換表~~

414A

牙光制御部

CONTROL

受光線理部

7

413

受光素子 412

PD PROC

定額消費電源

CURRENT
SOURCE

~~平定本ノ一~~

32

~~ムナミテ~~ 411

410

00

[12] ~~117~~ H19118

第28

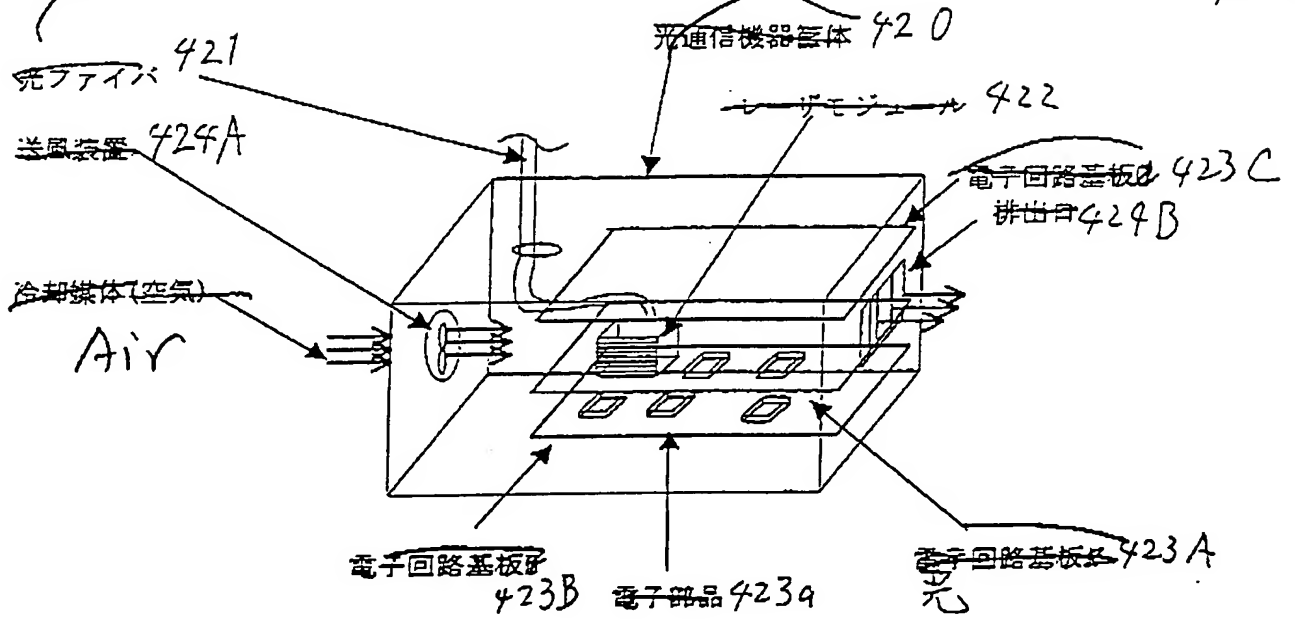


図19

[12] ~~119~~ F19119

第29

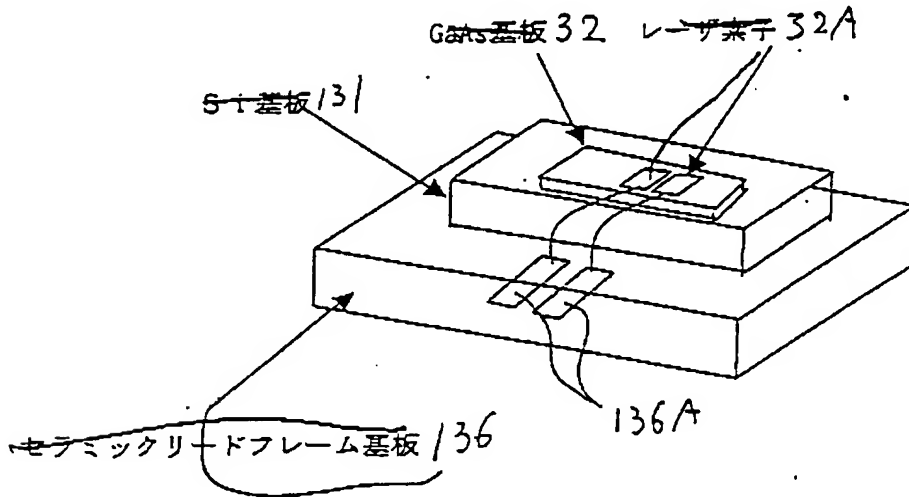


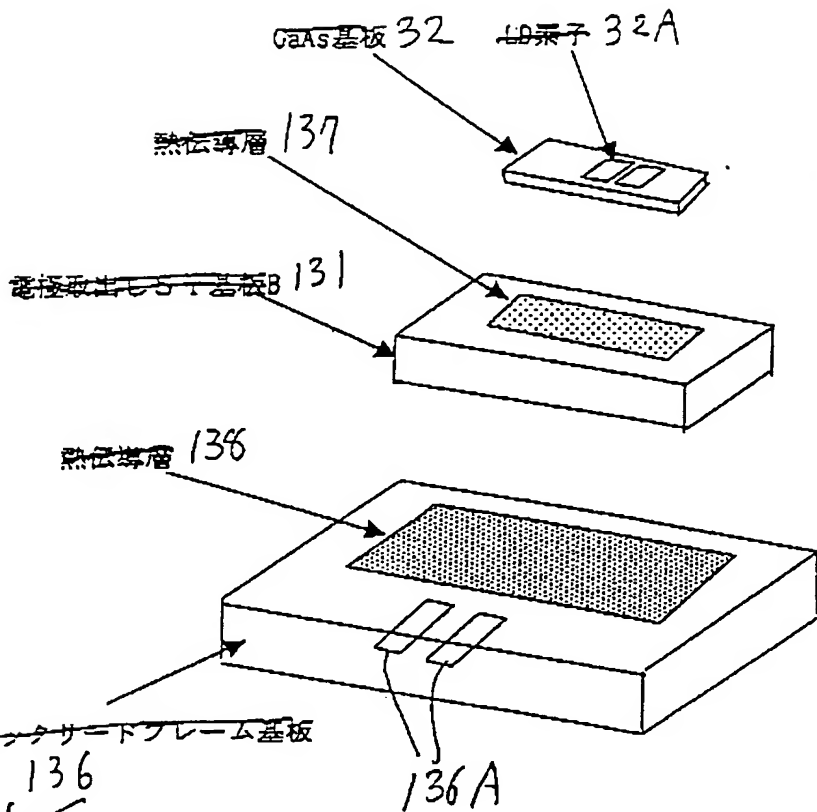
図20

10085204, 022602

120
~~131~~
~~43~~

H/G/120

カ29



121
~~124~~
~~43~~

図108

カ29

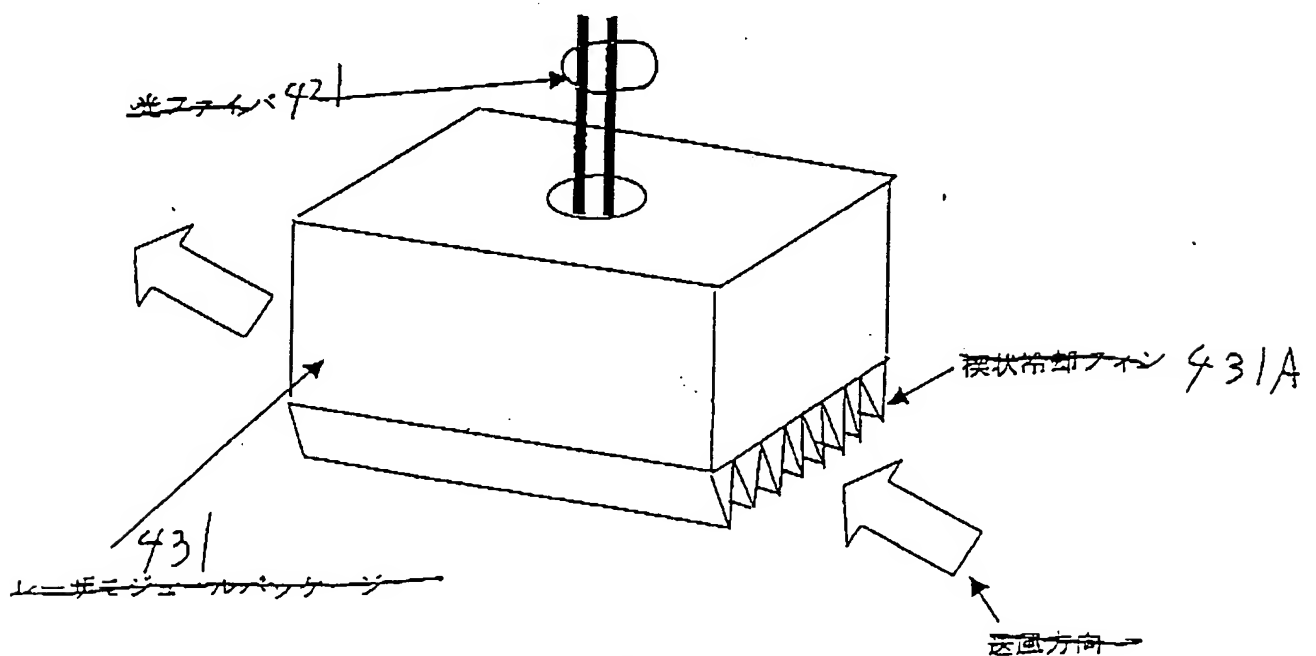


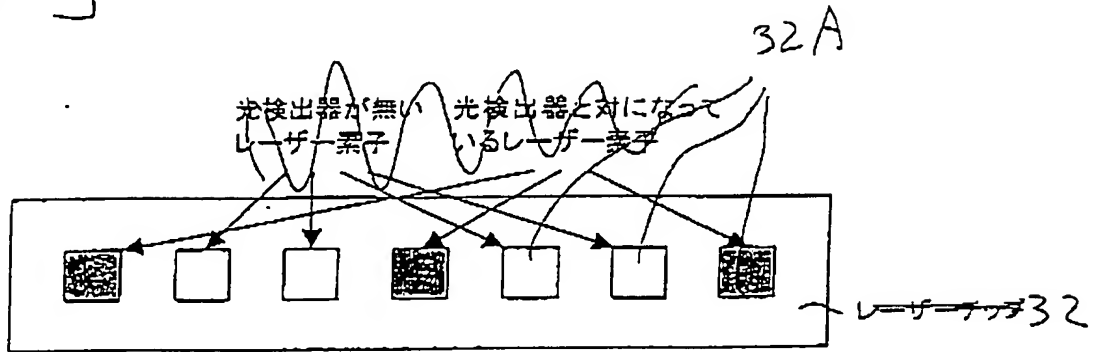
図109

10085204.022602

122
~~[12/105]~~

FIG 122

30



123
~~[12/106]~~
 FIG 123

FIG 105

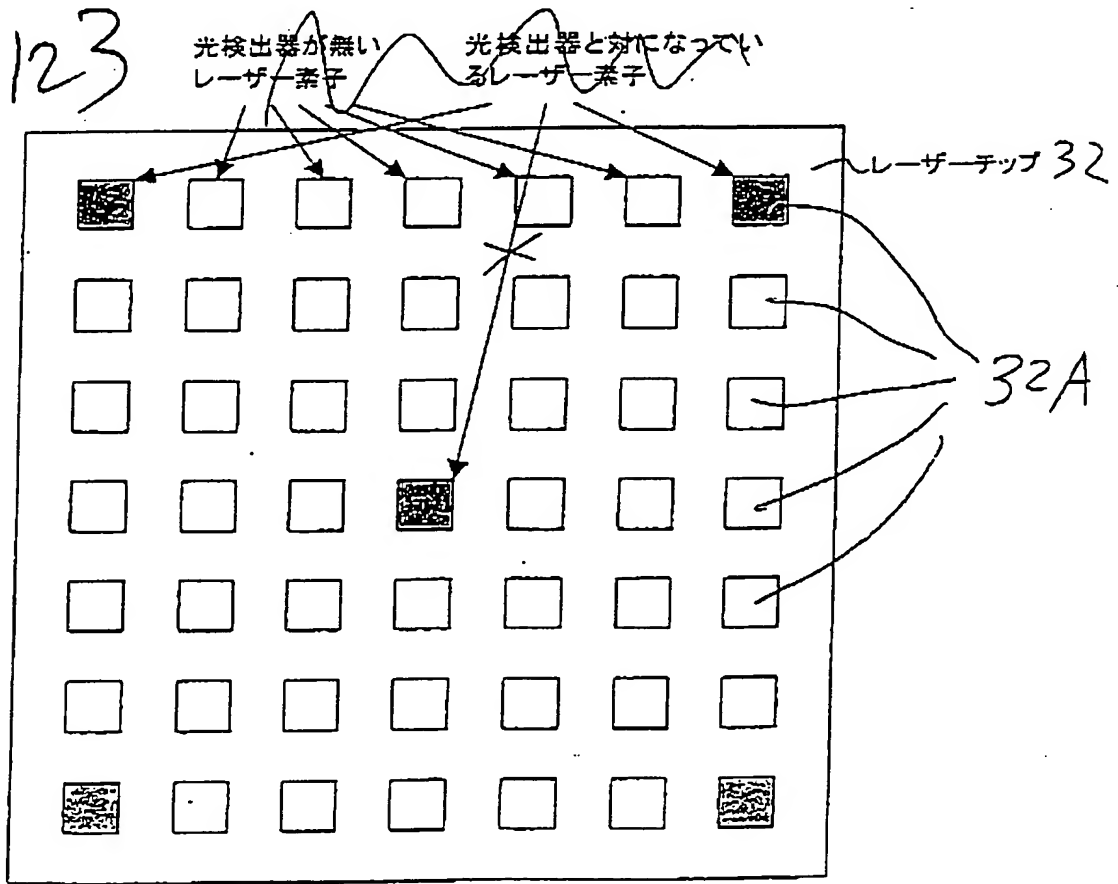
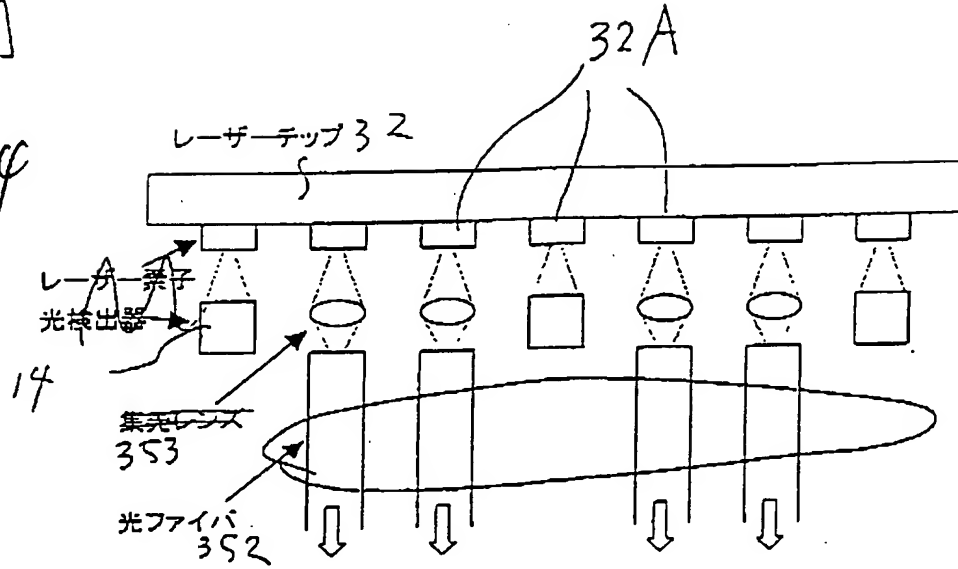


FIG 106

10085204, 022602

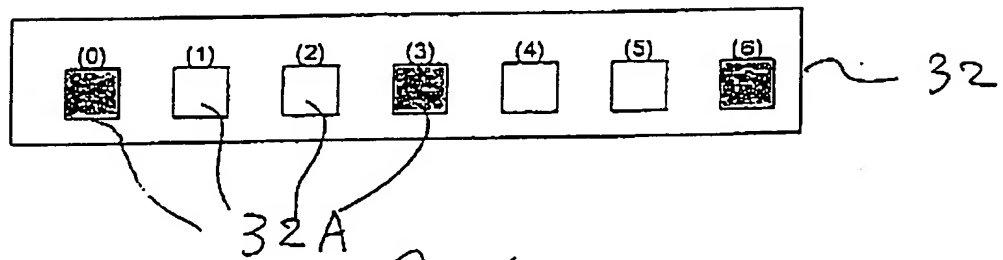
30

124
 [124]
 F/G/24



125
 [125]
 F/G/25

107



108

10085204 022602

[12/14/97]
126

930

FIG 126

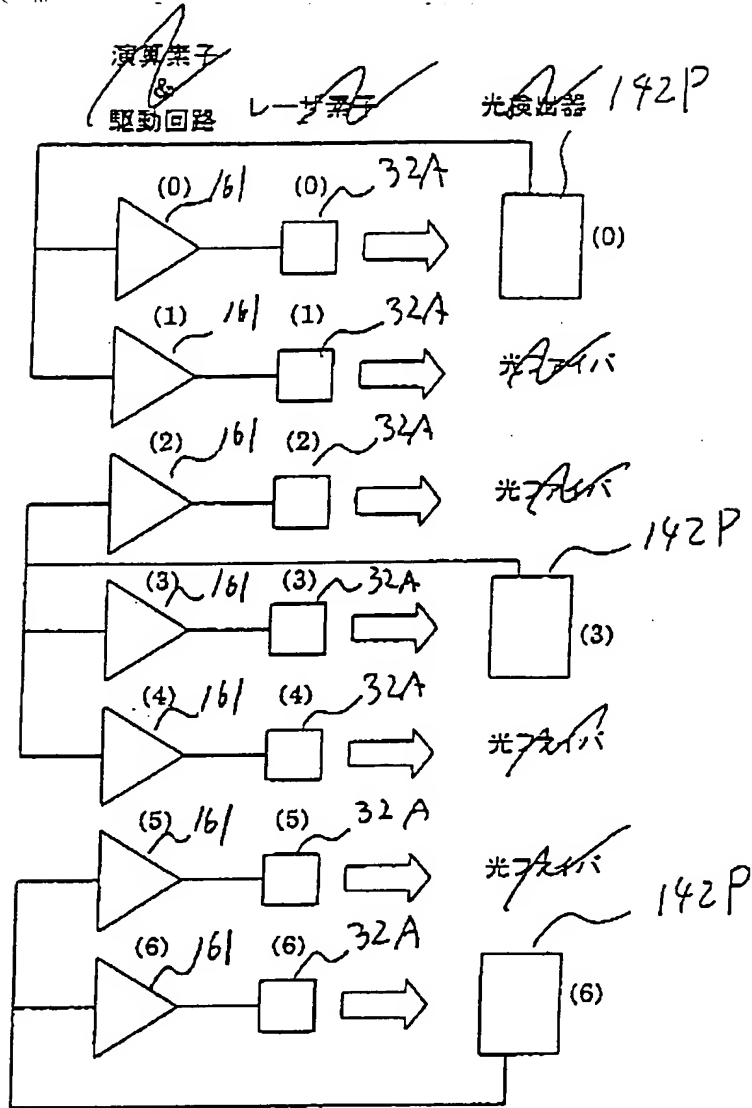


図 126

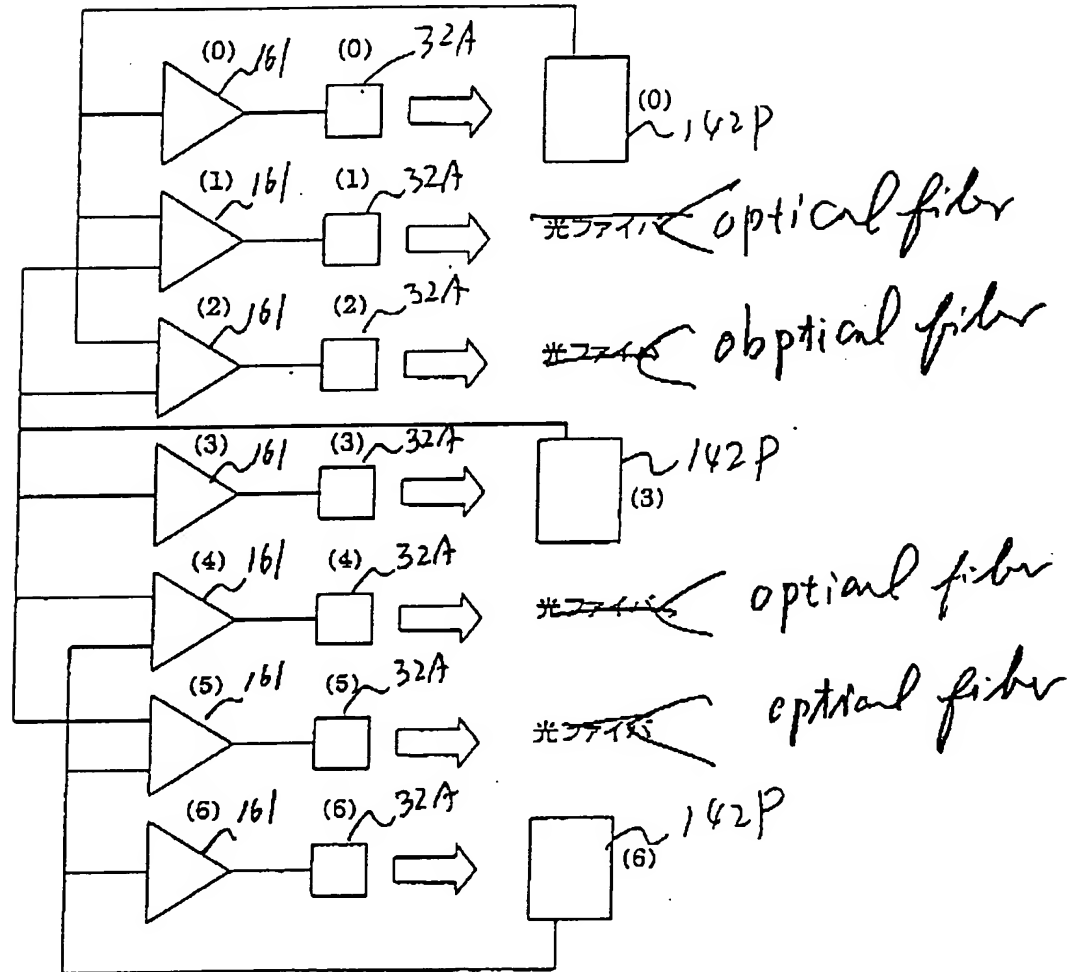
10085204, 022602

30

[2] #0
129

FIG 127

演算素子 & レーザ素子 光検出器



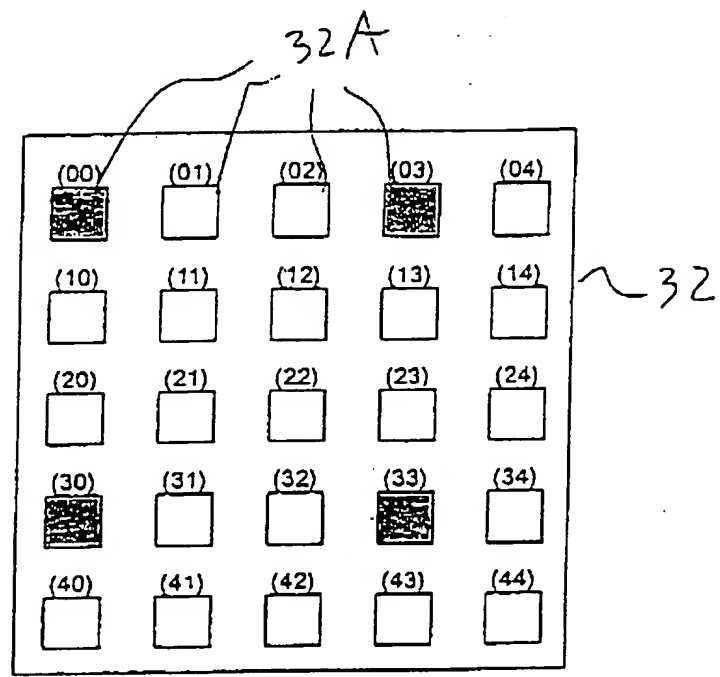
129

10085204 022602

30

[12] 128
 128

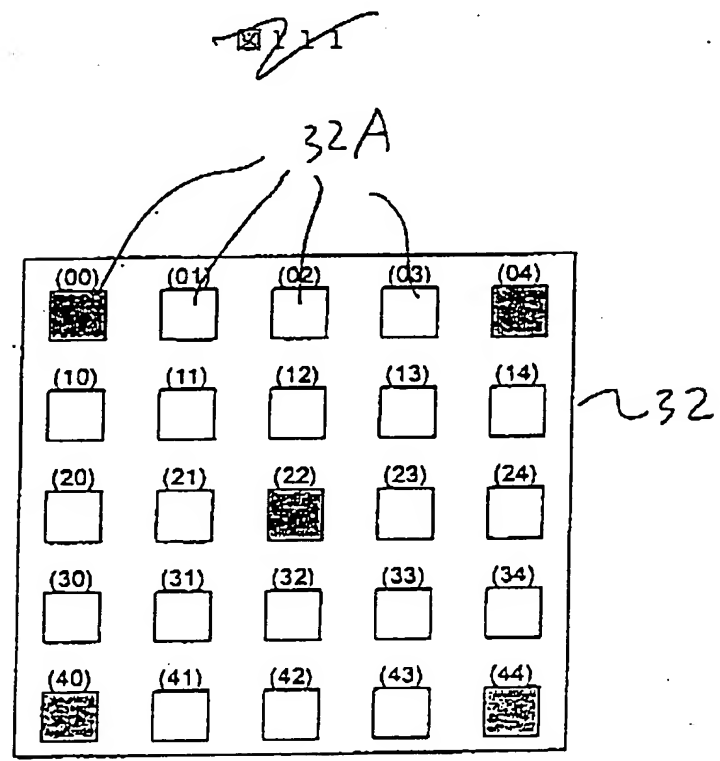
F/G/28



209220"4025800T

[12] 129
 129

F/G/29



1 12

FIG 130

FIG 130

LD array

Array Module

A31

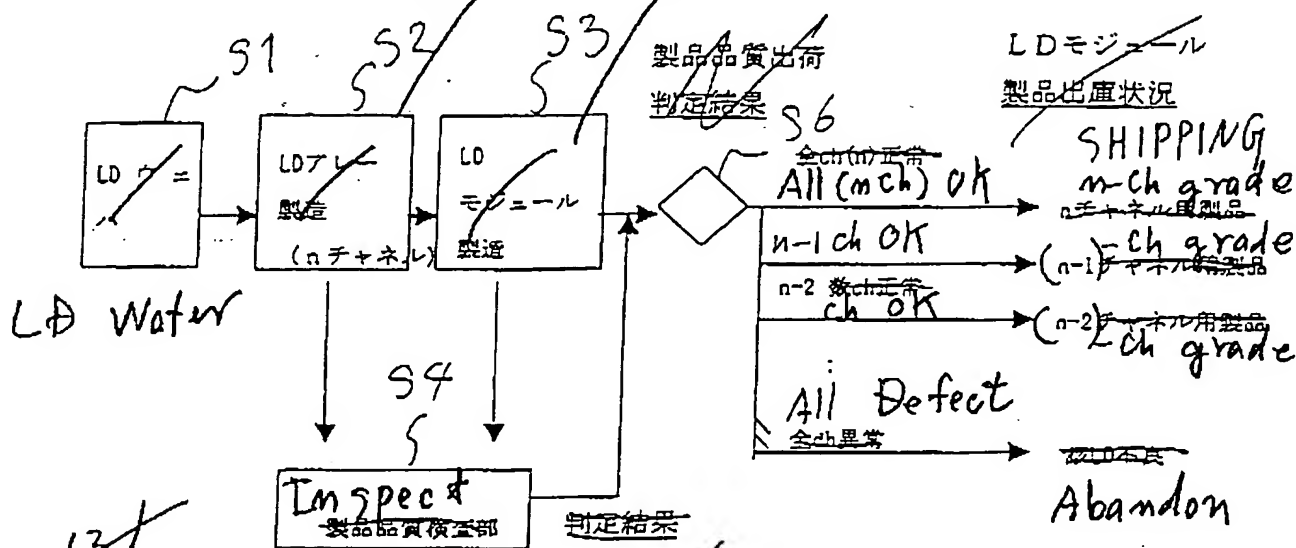


FIG 130

FIG 131

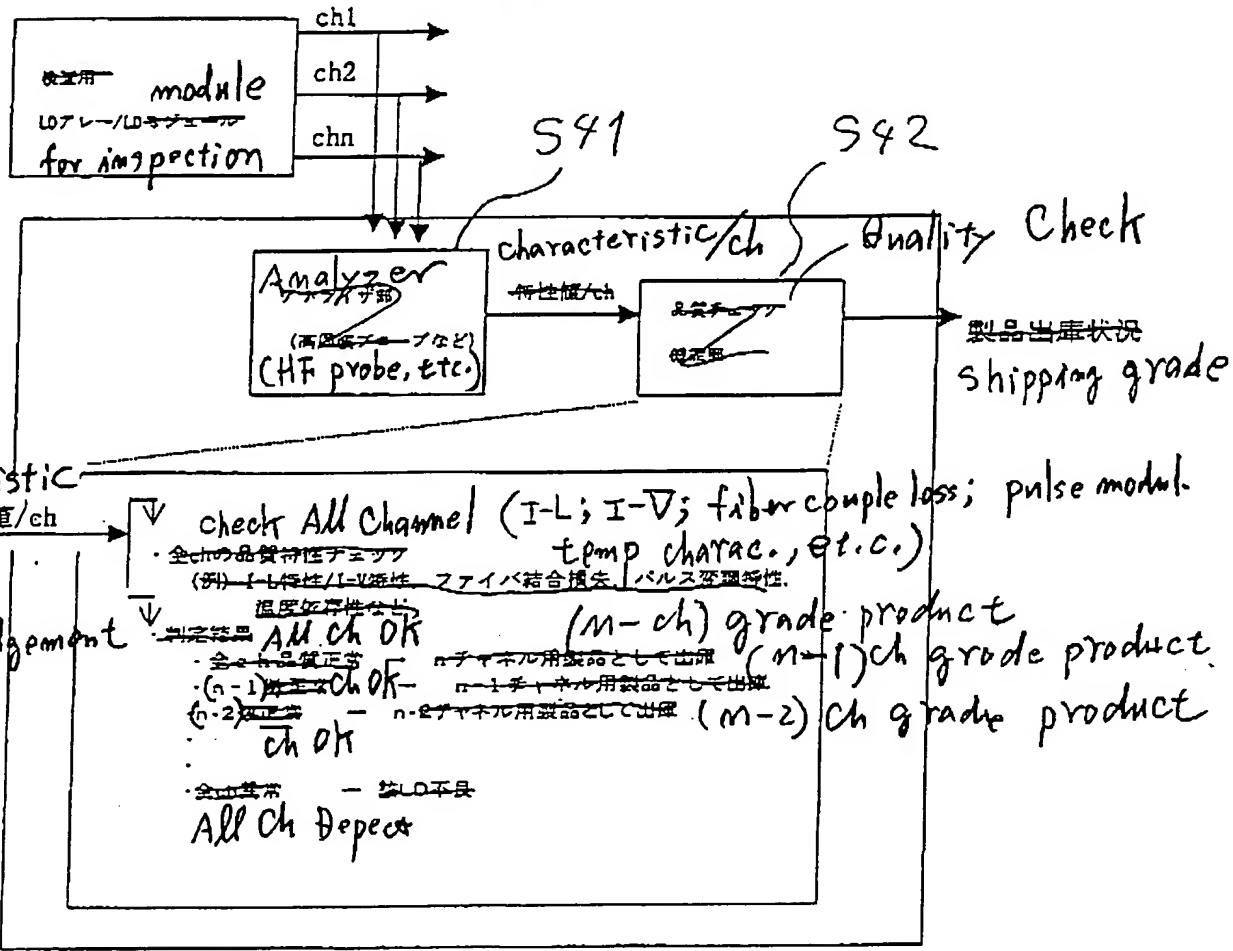


FIG 131

10085204, 022602